**UC Riverside**

**CERTIFICATE PROGRAMS**

1. Energy Management Professional Achievement Award

<http://www.extension.ucr.edu/academics/certificates/energy_management.html>

This program explores a range of issues involving energy use and management. Attention is given to specific facility management concerns such as energy conservation and resource management in industrial and commercial settings.

Participants in this program will examine:

* Supply, demand and regulation
* Cost/benefit of energy management
* System efficiency and maintenance
* Green technology and conservation strategies
* Creating and auditing an energy management plan

Who Can Benefit?

This program is designed for those seeking positions in facilities management, energy management, energy auditing, energy system management and other related fields.

### Energy Auditing-Principles and Practices

##### Course Number: ENGR X403.02

Surveys the fundamental knowledge, skills and experience necessary to conduct energy audits for residential, commercial and industry structures. Participants explore how to evaluate facility energy usage and opportunities to improve efficiency, reduce energy usage and the introduction of conservation measures.

**COURSES:**

### Energy Management-Principles and Practice

##### Course Number: ENGR X403

Examine the latest trends, innovations, and best practices for reducing costs associated with facilities usage.

* Energy management principles and techniques
* Controlling energy usage and costs
* Conducting the energy audit
* Energy codes and standards

### Energy Resource Management

##### Course Number: ENGR X403.01

Examines major energy resource management issues including demand, supply, utilization, management, monitoring, conservation and planning. Participants learn how to develop successful energy management strategies to eliminate waste, manage usage, control costs and plan for future demand.

### Heating, Ventilation and Air Conditioning (HVAC) Professional Achievement Award

### <http://www.extension.ucr.edu/academics/certificates/heating.html>

Learn about the dynamics of heating, ventilation and air conditioning in this program. Emphasis is on the commercial and industrial applications of HVAC systems, and development and design standards relating to California codes.

### COURSES:

### Heating, Ventilation and Air Conditioning (HVAC) Systems

##### Course Number: ENGR X465.39

Surveys air conditioning, heating and ventilation systems including cost and energy efficiency, load requirements, system design elements and tradeoffs in performance when evaluating various systems. Additional time is devoted to examine new technology and best practices currently being utilized in systems.

### Heating, Ventilation and Air Conditioning (HVAC): Equipment and Controls

##### Course Number: ENGR X465.4

Examines HVAC controls and equipment and their application to the many elements of heating, ventilating, and air conditioning systems. Emphasis is placed on commercial or industrial projects.

### Heating, Ventilation and Air Conditioning (HVAC): Principles and Practice

##### Course Number: ENGR X465.19

Heating, Ventilation and Air Conditioning (HVAC): Principles and Practice

Survey the principles and practices to effectively design, implement, and maintain HVAC systems.

* Heating and air conditioning system requirements
* Airflow calculations
* Design elements and constraints

1. NABCEP Solar Photovoltaic Entry Level Training and Certification

<http://www.extension.ucr.edu/academics/certificates/solar_installer.html>

A training course designed to prepare you to enter the solar field and to take the North American Board of Certified Energy Practitioners (NABCEP) PV Entry Level Exam. Upon completion of this course, student will be able to:

* Identify major components of a photovoltaic system.
* Identify types of PV systems.
* Identify panel types and characteristics.

### COURSES

### NABCEP Solar Photovoltaic Entry Level Training and Exam

##### Course Number: ENSC 803.13

A training course designed to prepare you to enter the solar field and to take the North American Board of Certified Energy Practitioners (NABCEP) PV Entry Level Exam. Topics include the fundamental principles of the application; design, installation and operation of grid-tied and stand-alone PV Systems; and an understanding of the objectives required by NABCEP.

### Solar Thermal Systems Installation Training

<http://www.extension.ucr.edu/academics/certificates/solar_thermal.html>

Upon completion of this course, student will be able to:

* Identify plumbing, electrical and other hazards associated with solar thermal installations, and implement preventive and remedial measures to ensure personnel safety.
* Identify the typical tools and components required for conducting the solar system installation

### Sustainable Development and Green Design Certificate

<http://www.extension.ucr.edu/academics/certificates/sustainable.html>

The Certificate in Sustainable Development and Green Design introduces the concepts and principles of sustainability through green building design, clean technologies, and innovative approaches to achieving the "triple bottom line" — economic, environmental and social sustainability.

Who Can Benefit?

This program is designed for:

* Land use planners
* Planning commissioners
* Architects
* Contractors and construction professionals
* Project and facility managers
* Government leaders
* Real estate professionals
* Engineers
* Interior designers
* Consultants in related fields.

### COURSES:

### Economics of Sustainability

##### Course Number: ENSC X460.4

Understand global sustainability issues and the economic impacts of population, food supply, pollution, forests, and energy in general.

### Green Building Design

##### Course Number: ENGR X402

Green design is not merely an attachment or supplement to architectural design; it is an integrated and multi-disciplinary process that moves development towards a more sustainable model.

### Public Policy Lecture Series: Sustainability Issues in Southern California

##### Course Number: ENSC X460.1

This lecture series explores public policy alternatives for fostering development reform and its potential economic and environmental impacts on communities in southern California.

### Sustainable Planning, Design and Development

##### Course Number: ENSC X460

Both urban and rural planning can benefit from including sustainability as a central criterion when designing roads, streets, buildings, and other components of the built environment.

### Sustainable Resource Management

##### Course Number: ENSC X460.5

The current concerns about climate change, renewable energy supply, low-carbon economy, and solid resources, with emphasis on the sustainable management of water.

### Trends in Energy Efficiencies and Technologies

##### Course Number: ENSC X460.6

### Green Construction and Building Methods

##### Course Number: ENSC X460.2

Life-cycle-based materials selection tools for better decision making in relation to their energy and environmental impacts and benefits.

### Planning Strategies for Sustainable Food Systems

##### Course Number: ENSC X401

Food systems planning strategies for more sustainable and self-reliant communities. You will review each phase within a food system, including production, processing and distribution; consumption and waste; best practices, promoting closed-loop resource recovery systems; and case studies

### Climate Action Planning

##### Course Number: ENSC X427.10

Case law, state regulations and science are driving the development of climate action planning. You will discuss global climate change and the consequences; direct and indirect greenhouse gas emissions; reducing emissions measures; adaptation strategies;

### Sustainable Interior Design

##### Course Number: ART X461.64

Teaches designers and consumers the fundamental principles and benefits of sustainable interior design. Designed to equip you with a systematic strategy for assessing the degree of sustainability and cost effectiveness of green design products. A thorough exploration of eco-friendly materials, energy saving appliances, and their sources will be covered.

### Public Health and the Built Environment

##### Course Number: ENSC X460.8

Examine public health issues that are grounded in and addressed by development patterns and urban form. Learn about the ongoing research, and how the relationship between land use and urban form affect personal activity, healthy food availability, air quality, access to health facilities, and safety.

**Courses treated as Full Time/Part Time in the field of Engineering.**

**Mechanical Engineering:**

<http://catalog.ucr.edu/UCR_Catalog_2011-12.pdf>

**ME 004. Energy and the Environment**

**ME 120. Linear Systems and Control**

**ME 121. Feedback Control**

**ME 133. Introduction to Mechatronics**

**ME 270. Introduction to Microelectromechanical Systems**

**Electrical Engineering and Computer Science Engineering:**

<http://catalog.ucr.edu/UCR_Catalog_2011-12.pdf>

**EE 115. Introduction to Communication System**

**EE 123. Power Electronic**

**EE 128. Data Acquisition, Instrumentation, and Process Control**

**EE 132. Automatic Control**

**EE 144. Introduction to Robotic**

**EE 150. Digital Communication**

**EE 151. Introduction to Digital Control**

**EE 160. Fiber-Optic Communication System**

**EE 224. Digital Communication Theory and System**

**EE 226. Wireless Communication**

**EE 235. Linear System Theory**

**EE 237. Nonlinear Systems and Control**

**Computer Science Engineering**

<http://catalog.ucr.edu/UCR_Catalog_2011-12.pdf>

**CS 100. Software Construction**

**CS 120B. Introduction to Embedded Systems**

**CS 122A. Intermediate Embedded and Real-Time Systems**

**CS 122B. Advanced Embedded and Real-Time Systems**

**CS 164. Computer Networks**

**CS 165. Computer Security**

**CS 166. Database Management Systems**

**CS 169. Mobile Wireless Networks**

**CS 180. Introduction to Software Engineering**

**CS 204. Advanced Computer Networks**

**CS 206. Testing and Verification Techniques in Software Engineering**

**CS 236. Database Management Systems**

**CS 240. Network Routing**

**CS 241. Advanced Topics in Network Measurements and Security**

**CS 245. Software Evolution**

**CS 246. Advanced Verification Techniques in Software Engineering**

**CS 253. Distributed Systems**

**CS 255. Computer Security**

**CS 257. Wireless Networks and Mobile Computing**

**Others:**

CEE 232. Green Engineering