Education & Training Plan

Student Name: ________________________________

Start & End Dates: ___/___/_____ to ___/___/_____

Solar Energy Specialist Certificate Program

Mentor Supported

MyCAA Program Information

Tuition: $3,950
Course Code: AU- SES3
Program Type: Certificate
Program Duration: 9 Months
Contact Hours: 495

This training program combines a three course training track:

- Photovoltaic System Professional
- Solar Water Heating Specialist
- LEED Green Associate

The Solar Energy Specialist is a comprehensive program and guide to installation of residential and commercial photovoltaic (PV) systems. This course covers the principles of PV electricity and how to effectively incorporate it into stand-alone or utility-connected electrical systems. We give detailed illustrations to clarify the concepts behind PV system operation. Also learn heating water with the sun which is a practice almost as old as humankind itself. This Solar Water Heating Specialist course is a guide to this clean and cost-effective technology. Finally, our Leadership in Energy and Environmental Design (LEED) Green Associate course provides the foundational concepts and standards for the residential, commercial and institutional green building industry. This course prepares students to sit for the LEED Green Associate exam and forms the foundation for a career as a LEED Professional. Course content covers green building core concepts and strategies, sustainable thinking and implementation, LEED standards and rating systems, and an overview of the LEED Green Associate credentialing exam.

The Job Outlook
According to the report detailed by Bloomberg, 36,600 technical employees will be involved in the U.S. solar industry in 2020, representing an increase of about 24 percent since 2010. The
wind sector, in contrast, will only grow to 27,700 jobs, roughly 14 percent. Solar energy is steadily becoming a major player across the country, as 3.9 GW of panels are expected to be installed in 2013.

Certification:
Upon successful completion of our Photovoltaic System Professional course, students will be prepared for an entry-level position as in the solar industry and will be prepared to sit for the NCCB national certification exam to become a Certified Photovoltaic System Specialist (CPSS).

Certification:
Upon successful completion of the LEED Green Associate course, students will be prepared to sit for the U.S. green Building Council - LEED Green Associate Certification exam to become a Certified LEED Green Associate.

Photovoltaic System Professional
225 Hours

Overview
The Photovoltaic System Professional is a comprehensive course and guide to installation of residential and commercial photovoltaic (PV) systems. This course covers the principles of PV electricity and how to effectively incorporate it into stand-alone or utility-connected electrical systems. We give detailed illustrations to clarify the concepts behind PV system operation. The Photovoltaic System Professional course covers topics including PV industry growth, solar radiation, array orientation, components and system configurations, system sizing and design, mechanical and electrical installation, utility interconnection, codes and regulations, PV specific safety practices, maintenance, troubleshooting, and economic analysis. This course also includes a comprehensive CD-ROM.

After completing this course, you should be able to:

- Define the core elements of photovoltaics and solar energy technology
- Define systems components, configurations, and battery types
- Identify elements of charge controllers and inverters
- Identify components of mechanical and electrical integration
- Identify permitting codes and regulations

Outline
Photovoltaic System Professional Module 1
Photovoltaics, Solar Radiation & Preplanning

- Introduction to Photovoltaics
- PV Applications
- PV Industry
- Solar Energy Technologies
- The Sun
- Sun-Earth Relationships
- Array Orientation
- Solar Radiation Data Sets
- Estimating Array Performance
- Preliminary Assessment
- Site Surveys
- Installation Planning

Photovoltaic System Professional Module 2
System Components & Configurations

- System Components
- Electrical Energy Sources
- PV System Configurations
- Photovoltaic Cells
- Current-Voltage (I-V) Curves
- Device Response
- Modules and Arrays
- Battery Principles
- Battery Types
- Battery Systems

Photovoltaic System Professional Module 3
Controllers, Inverters & Sizing Systems

- Charge Controller Features
- Charge Controller Types
- Charge Controller Setpoints
- Charge Controller Applications
- AC Power
- Inverts
- Power Conditioning Units
- Inverter Features and Specifications
- Sizing Methodologies
- Sizing Calculations

Photovoltaic System Professional Module 4
Mechanical & Electrical Integration

- Mechanical Considerations
- Array Mounting Systems
- Mechanical Integration
- National Electrical Code®
- Voltage & Current Requirements
- Conductors & Wiring Methods
- Overcurrent Protection
- Disconnects
- Grounding
- Battery Systems
- Distributed Generation
- Utility Interconnection Policies
Photovoltaic System Professional Module 5
Permitting, Maintenance & Troubleshooting

- Building Codes and Regulations
- Permitting
- Inspection
- Commissioning
- Maintenance
- Monitoring
- Troubleshooting
- Economic Analysis
- Incentives
- Cost Analysis

Solar Water Heating Specialist
135 Hours

Overview

Heating water with the sun is a practice almost as old as humankind itself. This Solar Water Heating Specialist course is a guide to this clean and cost-effective technology.

Beginning with a review of the history of solar water and space heating systems from prehistory to the present, this course presents an introduction to modern solar energy systems, energy conservation, and energy economics.

This course covers:

- Types of solar collectors, solar water, and space heating systems and solar pool heating systems, including their advantages and disadvantages
- System components, their installation, operation, and maintenance
- System sizing and siting
- Choosing the appropriate system

This course also focuses on the financial aspects of solar water or space heating systems, clearly showing that such systems generate significant savings in the long run.

After completing this course, you should be able to:

- Define the core elements of solar water heating
- Identify various solar heating systems
- Identify the steps involved in choosing the right system
- Identify the steps to install and operate a solar heating system
- Identify the steps to maintain a solar heating system
Outline

Solar Water Heating Specialist Module 1 Understanding Solar Water Heating

- History of Solar Water Heating
- Economics of Solar Water Heating
- History of Fossil Fuels
- Life-Cycle Costing
- Types of Solar Collectors
- Other System Components
- Storage Tanks
- Heat Exchangers
- Pumps, Piping, & Pipe Insulation

Solar Water Heating Specialist Module 2 Solar Water & Space Heating Systems

- Pressurized Antifreeze Systems
- Drainback Systems
- Integral Collector Storage Systems
- Thermosiphon Systems
- Solar Heated Pools
- Solar Heated Hot Tubs & Spas
- Liquid-Type Solar Heating Systems
- Heat Delivery Methods
- High-Mass Systems

Solar Water Heating Specialist Module 3 Choosing the Right System

- Siting a Solar Energy System
- Sizing a Solar Water Heating System
- Sizing a Solar Space Heating System
- Sizing Components
- Sizing Expansion Tanks
- Sizing Air Heating Systems

Solar Water Heating Specialist Module 4 System Installation, Operation, & Maintenance

- Installing Solar Water Heating Systems
- Handling & Mounting Solar Collectors
- Mounting the Heat Exchanger
- Plumbing the System
- Testing the System
- Installing Solar Pool Heating Systems
- Installing Radiant Floor Tubing
- Charging a Pressurized System
- Controls & Power Sources
- Maintenance
**Certification:**
Upon successful completion of our Solar Water Heating Specialist course, students will be prepared for an entry-level position as in the solar industry and will be prepared to sit for the NCCB national certification exam to become a *Certified Solar Water Heating Specialist* (CSWHS).

**LEED Green Associate**
135 Hours

**Overview**
Our Leadership in Energy and Environmental Design (LEED) Green Associate course provides the foundational concepts and standards for the residential, commercial and institutional green building industry. This course prepares students to sit for the LEED Green Associate exam and forms the foundation for a career as a LEED Professional. Course content covers green building core concepts and strategies, sustainable thinking and implementation, LEED standards and rating systems, and an overview of the LEED Green Associate credentialing exam.

After completing this course, you should be able to:

- Identify the principles of the U.S. Green Building Council and LEED standards and ratings
- Recognize strategies for efficiently using energy, water, and other resources in the building industry
- Recall methods for promoting occupant health and productivity in indoor environment design
- List principles for reducing waste, pollution, and environmental degradation in the building industry
- Recognize the principles of sustainable thinking, iterative and innovative design, and the implementation process

**Outline**

**LEED Green Associate Module 1**
**Becoming a LEED Green Associate**

- LEED Green Associate Certification
- Intro to Green Building
- Employment Opportunities
- Specialized Communication Skills
- LEED Applications
- Green Associate Exam
- LEED Green Core Concepts
- Climate Change
- Life-Cycle Approach
- Cost of Green Building
LEED Green Associate Module 2
Overview of USGBC and LEED

- U.S. Green Building Council
- LEED Rating Systems
- Program Requirements
- Impact Categories
- Certification Levels and Process
- Location and Transportation
- Site Development
- Health and Livability
- Sustainable Sites
- Rainwater Management

LEED Green Associate Module 3
Efficiency, Atmosphere and Resources

- Water Conservation
- Full Time Equivalent (FTE)
- Reducing Water Use
- Reducing Energy Demand
- Energy Efficiency
- Renewable Energy
- Product Attributes and Disclosures
- Material Conservation
- Waste Management
- Environmentally Preferable Materials

LEED Green Associate Module 4 Environmental Quality and Innovation

- The Indoor Environment
- Air Quality Strategies
- Lighting Intents
- Occupant Comfort, Health and Satisfaction Intents
- Space Categorization
- Unoccupied Spaces
- Innovation Intents
- Regional Priority
- Regional Priority Strategies

LEED Green Associate Module 5 Green Buildings and Communities

- The Environmental Impacts of Buildings
- What is Green Building?
- The Rise of the Green Building Industry
- Green Building Location
- Green Building Costs and Savings
- Sustainable Thinking
- Life-Cycle Approach
- Integrative Process
- Team Selection
- Observation

**LEED Green Associate Module 6**

**Green Building Core Concepts and Applications**

- Application Strategies
- Location and Transportation
- Sustainable Sites
- Water Efficiency
- Energy and Atmosphere
- Materials and Resources
- Indoor Environmental Quality
- Innovation
- About the USGBC
- About LEED

**Materials:**

All materials are included in this course.

**Certification:**

Upon successful completion of the LEED Green Associate course, students will be prepared to sit for the U.S. Green Building Council - LEED Green Associate Certification exam to become a **Certified LEED Green Associate.**

**System Requirements:**

**Internet Connection**

- Broadband or High-Speed - DSL, Cable, and Wireless Connections

*Dial-Up internet connections will result in a diminished online experience. Classroom pages may load slowly and viewing large audio and video files may not be possible.

**Hardware Requirements**

- Processor - 2GHz Processor or Higher
- Memory - 1 GB RAM Minimum Recommended

*While our courses are accessible through multiple mobile learning platforms, some courses may include a CD or DVD with the Textbook, so you may need access to a computer with CD-ROM or DVD Drive.

**PC Software Requirements**

- Operating Systems - Windows Vista, Windows 7, Windows 8 or 8.1
- Microsoft Office 2007, 2010 or 2013 or a Word Processing application to save and open Microsoft Office formats (.doc, .docx, .xls, .xlsx, .ppt, .pptx)
• Internet Browsers - Google Chrome is highly recommended  
  o Cookies MUST be enabled  
  o Pop-ups MUST be allowed (Pop-up Blocker disabled)  

• Kindle Reader App is needed for many of our courses (No special equipment needed. This can be downloaded for FREE onto your computer.)
• PowerPoint Viewer (if you do not have PowerPoint)  
• Adobe PDF Reader  
• QuickTime, Windows Media Player &/or Real Player  

MAC Software Requirements

• Operating Systems - Mac OS x 10 or higher with Windows  
• Mac office programs or a Word Processing application to save and open Microsoft Office formats (.doc, .docx, .xls, .xlsx, .ppt, .pptx)  
• Internet Browsers- Google Chrome is highly recommended  
  o Cookies MUST be enabled  
  o Pop-ups MUST be allowed (Pop-up Blocker disabled)  
• Kindle Reader App is needed for many of our courses (No special equipment needed. This can be downloaded for FREE onto your computer.)  
• PowerPoint Viewer (if you do not have PowerPoint)  
• Adobe PDF Reader  
• Apple QuickTime Media Player  
• If your course has a CD-ROM or DVD included, you may need to have Microsoft Window Operating Systems over Bootcamp (Bootcamp is a free download from Apple’s website) or Windows setup with Parallels.

**Outlines are subject to change, as courses and materials are updated.**