



**Approved for WIA  
Training, ETPL Listed**

### Who Should Attend

#### Primary Audience:

**Previous work experience in:**  
construction, HVAC, plumbing,  
roofing, electrical and/or  
Mechanical Engineering

**Those with a background in:**  
skilled trades such as construction, elec-  
trical, installation, and repair.

#### Secondary Audience

Those looking to gain industry  
foundations to transition into  
solar careers such as :

- Management
- Marketing/Sales
- Engineering
- Research
- Purchasing
- Customer Service/Administration

### How to Register for the Solar Intensive Training Course:

Got to [www.commed.ohlone.edu](http://www.commed.ohlone.edu)  
Solar Intensive Course is listed under  
professional development section.  
WIA case managers call 510-742-2303



The mission of the Ohlone College Department of Environmental Studies is to prepare students to be active participants in shaping a sustainable future. By fostering student understanding of how human society and the environment are interwoven, our program emphasizes the benefits of the triple-bottom line - promoting stewardship of the earth, fostering innovation for a strong economy, and respect, value and equity for the lives of all living things.

### Degrees and Certificates Offered by Ohlone's Environmental Studies Program

Review academic requirements in the [Catalog](#) and in the [Curriculum Guides](#). All students are encouraged to meet with a [counselor](#) to review academic program requirements and/or have questions answered.

#### **Associate Degrees:**

[Environmental Studies A.A. and Transfer Major](#)

[Environmental Science A.S. and Transfer Major  
Certificate of Accomplishment \(also known as  
Fast-Track Certificate\):](#)

[Environmental Stewardship \(PDF\)](#)

[Earth and Environmental Sciences \(PDF\)](#)

**For additional information visit**

[http://www.ohlone.edu/instr/envstudies/  
solarintensivetraining.html](http://www.ohlone.edu/instr/envstudies/solarintensivetraining.html)

A World of Cultures  
United in Learning



# Solar Intensive Training Course

**Course Date: April 5–9, 2010**

**Time: 9 AM–5 PM**

**\$2,500.00 (includes text book)**

**Location: Ohlone College Newark Center**

**39399 Cherry St, Room: NC 1102**

**Register Online: <http://commed.ohlone.edu>**



**Ohlone College Community Education**

**Ohlone College Newark Center**

**39399 Cherry Street, Room 1211**

**Newark, CA 94560**

**<http://commed.ohlone.edu>**

**510-742-2303**

K. Utility-Interactive Systems  
1. Introduction and system sizing economics

2. Net Metering  
3. Interconnection Agreement  
L. Integrating Photovoltaics into Buildings  
1. Retrofitted PV Systems  
2. BIPV Options  
3. Costs/Benefits

M. Photovoltaic System Applications  
1. Tools and Appliances  
2. Water Pumping  
3. Generators

N. Photovoltaic Installation  
1. Preparing for Installation  
2. Photovoltaic Array Installation  
3. PV Installation Final Check List  
O. Maintenance and Troubleshooting  
1. Materials and Tools List  
2. Maintaining Systems  
3. Troubleshooting Systems

P. Safety and Installation  
1. Basic Safety  
2. Safety Equipment

Q. Best Practice

## Lab Outline

A. Use of multimeters, explore the

properties of solar cells

B. Build a variety of solar electric cir-

cuits to power a variety of appliances

C. Begin to diagram, take apart and

wiring up stand alone solar electric

D. Experiment working with 12, 24 and

48 volt solar array configurations.

E. Build AD, DC and hybrid load cen-

ters.

F. Wire up and explore higher voltage

grid systems.

G. Wire a grid tied system into a real or

mock grid.

H. Finish the unfinished.

## Course Content:

A. An overview of Photovoltaics

1. The development of Photovoltaics  
2. Photovoltaic system components  
3. Photovoltaic system types

B. Photovoltaic Electric Principles

1. Terminology  
2. Electrical circuits  
3. Series and parallel circuits in power

C. The Solar Resource  
sources and loads  
3. Series and parallel circuits in power

1. Solar radiation fundamentals  
2. Solar site analysis  
3. Site data

D. Electric Load Analysis  
1. Using energy efficiently  
2. Calculating load estimates  
3. Electric load analysis

E. Photovoltaic Models

1. Basic Principles  
2. Module Performance  
3. Mounting Modules

F. Batteries

1. Types and Orientation  
2. Specifications  
3. Wiring configuration

G. PV Controls

1. Controller Types  
2. Controller Features  
3. Specifying a Controller

H. Inverters

1. Operating Principles  
2. Features  
3. Types

I. Photovoltaic System Wiring

1. Wire Size  
2. Overcurrent Protection  
3. Grounding

J. Sizing Photovoltaic Systems

1. Design and sizing  
2. Sizing Worksheets  
3. Sample System Exercises



## Learning Objectives

1. Analyze solar photovoltaic system energy and building resources.
2. Critically assess solar photovoltaic system applications, site evaluation, design analysis, codes and materials, and methods of installation.
3. Investigate solar photovoltaic systems and their relationship with energy conservation, scarce resources and the environment.
4. Compare and contrast solar photovoltaic system energy sources and applications.

## Course Participation Advisory and Recommendations

High school diploma or GED

College English

College Math

Ability to lift 50 pounds

Ability to tolerate heights (example

working on building roofs)