Applied Solar Photovoltaic Systems
Outline of Instruction

Course Information

Organization	Monroe County Community College, Applied Science and Engineering Technology
Development Date	March 3, 2011
Course Number	ELEC 257
Potential Hours of Instruction	60
Total Credits	3

Description
This course expands on and applies the PV concepts and principles from ELEC 157. This is a hands-on course where PV systems are sized, designed, configured, procured, built, tested, and maintained.
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Major Units
Solar Insolation – Find the sun
Array configurations
Inverters – Micro Inverters / Boosters
MPPT
The Battery Bank – design, care, feeding
On Grid / Off Grid
The Web – Keeping current, but recognizing Snake Oil
Smoke – why did it fail?
National Electric Code
Installation – modules and BOS
Permitting / Inspectors

CLASS PROJECTs – design / build / commission a local PV system.

Types of Instruction:

Instruction Type	Contact Hours
Classroom Presentation	30
On-Campus Laboratory	30

Prerequisites
ELEC 157 – Grade of C or better

Exit Learning Outcomes

General Education Outcomes

A. Communicate ideas in writing using the rules of standard English
B. Communicate information in writing using the rules of standard English
C. Apply mathematical approaches to the interpretation of numerical information
D. Apply mathematical approaches to the analysis of numerical information
E. Demonstrate an understanding of the process of scientific inquiry
F. Use computer technology to retrieve information
G. Use computer technology to communicate information

Course Outcomes

1 Analyze a site and evaluate its potential for Photovoltaic generation.
2 Identify key PV module electrical parameters and performance ratings. Relate these to its output and usability for a given application.
3 Identify and select proper inverter / module configurations
4 Specify and procure individual components based on availability, performance, and cost.
5 Test components to nameplate specifications.
6 Describe PV system assembly and installation requirements.
7 Perform IV curve verification of modules and arrays.
8 Define PV system repair and preventative maintenance requirements.
9 Perform system cost and benefit trade-off analyses based on current financial information.
10 Create and perform a Site Acceptance Test.
11 Configure, size, assemble, and maintain battery backup systems including supporting electronics.
12 Identify and design to correct NEC requirements.
13 Design and configure a complete PV system array based on user input.
14 Size, design, and configure grid-tie inverter subsystems.