COURSE INFORMATION FORM

DISCIPLINE  
INTE

COURSE TITLE  
Solar/Photovoltaic Design and Installation

CR.HR  4  
LECT HR.  2  
LAB HR.  4  
CLIN/INTERN HR.  
CLOCK HR.  

CATALOG DESCRIPTION

Design, installation and maintenance of grid-tied and stand-alone photovoltaic systems. This course is designed to prepare the student for the NABCEP Entry-Level PV Installer Certification Exam.

PREREQUISITES

INTE 142, INTE 185 and either ETEC 110, HVAC 109 or INTE 110

EXPECTED STUDENT OUTCOMES IN THE COURSE (ESO)

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

1. Analyze load demand and synthesize with site-specific data to correctly size array, batteries and inverter for a photovoltaic system.

2. Calculate peak power output and monthly and annual energy output, and synthesize with other data to compare costs and benefits to end-user of a photovoltaic system.

3. Design a basic photovoltaic system that is correctly sized and meets all code requirements.

4. Safely install a basic photovoltaic system under qualified supervision, demonstrating correct roof penetration techniques.

5. Generate a list of appropriate balance of system (BOS) components and necessary equipment for a specific photovoltaic system installation.

6. Troubleshoot a photovoltaic system for design errors and performance problems.

GENERAL EDUCATION OUTCOMES (ESO)

Specify which general education outcomes, if any, are substantially addressed by the course. Numbers in parentheses identify the Expected Student Outcomes linked to the specific General Education Outcome.

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<th>Outcomes</th>
<th>ESO</th>
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Revised 10/21/11
PROGRAM-LEVEL OUTCOMES

CAREER AND TECHNICAL EDUCATION PROGRAM OUTCOMES
Specify which Career and Technical program outcomes, if any, are substantially addressed by the course by completing the “Career and Technical Education template” to show the relationship between course and program outcomes to assessment measures.

The student will demonstrate:

1. The ability to apply foundational skills in an industrial setting, safely and to industry guidelines.
2. Professional oral and written communication skills.
3. Thinking critically and apply problem-solving skills.
4. The competence in the entry-level skills of technical profession in industrial technology.

CLASS-LEVEL ASSESSMENT MEASURES
Student accomplishment of expected student outcomes may be assessed using the following measures. (Identify which measures are used to assess which outcomes.)

1. Written examinations (1 - 6)
2. Projects (3, 4, 6)
Individual instructors may order this outline as fits the needs of their individual courses. In addition, they may place more emphasis on some areas than on others. What is assured is that this particular list is covered in the course. Other topics may be added to a course as the instructor sees fit, and as time and interest allow. An *asterisk can be used to mark an item as optional.

I. Load Demand Analysis and Site Evaluation

II. PV System Design
   A. Array sizing and array mounting methods
   B. Inverter and Transformer Selection
   C. Electrical balance of system and code compliance
   D. Mechanical balance of system and code compliance

III. PV System Installation
   A. Array Installation
   B. Electrical balance of system installation, including monitoring and controls
   C. Batteries (for stand-alone systems)
   D. Mechanical balance of system

IV. PV System Maintenance and Troubleshooting
   A. Common design errors
   B. Common performance problems
   C. System maintenance

V. Safety Issues