NC STATE UNIVERSITY *PRESENTS the...*

# RENEWABLE ENERGY TECHNOLOGIES

## DIPLOMA SERIES

**Learn to take advantage of up to 30% Federal Tax Credits for Renewable Energy Systems!**

**The diploma program that provides hands-on, practical interdisciplinary education in renewable energy technologies.**

- Receive continuing education units, professional development hours and AIA learning units from North Carolina State University
- Add credentials to your career with non-degree diploma status
- Attend three convenient one-week programs to complete your diploma in Renewable Energy Technologies

## NEW STUDENTS ENROLL NOW!

| | |
|---|---|
| **RE II: PV (Business Basics)** | **September 14–18, 2009** |
| **RE III: Solar Thermal** | **November 9–13, 2009** |
| **RE IV: PV (Electricity Basics)** | **November 30–December 4, 2009** |
| **RE IV: PV (Electricity Basics)** | **December 14–18, 2009** |

**Brought to you by:**

NORTH CAROLINA SOLAR CENTER

**Accredited by:**

IREC Interstate Renewable Energy Council — ISP Q ACCREDITED Continuing Education Provider™

**REGISTER TODAY! On-line at http://ContinuingEducation.ncsu.edu/RenewableEnergy.html or Call 919.515.2261**

# RENEWABLE ENERGY TECHNOLOGIES

## DIPLOMA SERIES

July 2009 photovoltaics class participants standing on the training roof behind their recently installed grid-tied PV system.

## Why Study Renewables at NC State University's Solar Center?

NC State University's Solar Center launched the Renewable Energy Technologies (RET) Diploma Series in 2004. Graduates of the series gain a solid understanding of the technical, theoretical, political and financial aspects of renewable energy while earning a diploma from a distinguished university. They also learn and network with fellow students, further adding value to their experience.

As the nation moves towards greener technologies, it has become essential to familiarize, if not excel, in this expanding industry. Take advantage of this unique opportunity by taking one or all of the classes offered by the NC Solar Center.

## About the Program

The RET Diploma Series is a non-degree continuing education program that provides technical and hands-on training, information on current policies and technologies, and a support network of experienced RE professionals. In addition, the program can help meet required certifications for some renewable energy professionals, like NABCEP-PV or Progress Energy Carolinas' SunSense Program.

Currently, the RET Diploma Series offers training in the following technologies: solar thermal, solar electric (photovoltaic or PV) and wind.

## Who should attend?

The program is geared especially for electricians and electrical contractors, plumbers and HVAC professionals, builders and architects, entrepreneurs and interested individuals who want to gain a higher level of professional training in the field of renewable energy.

## How do I complete the program?

The program allows you to build an interdisciplinary course that gives an in-depth understanding of 'green' technologies. To earn the diploma, you are required to complete 105 contact hours, or three 35-hour workshops within three years, and make a 15-minute presentation on your future plans with the knowledge gained. A certificate of completion is given at the end of each weekly or stand-alone course. **Students must be present for 90% of the course to get full credit.**

## Primary Instructors

### Bill Guiney
### Solar Thermal

Bill Guiney is the Program Manager for Renewable Energy Solutions at Johnson Controls, Inc. His areas of responsibility include both photovoltaic and solar thermal technologies. Bill has 27 years of experience in the solar industry as a retailer, contractor, distributor, manufacturer and educator.

Bill has provided many renewable energy and energy efficiency training programs and has been an instructor for solar thermal energy systems at the Florida Solar Energy Center and NC Solar Center. He is on the solar thermal technical committee of the North American Board of Certified Energy Professionals (NABCEP) and provides the NABCEP Solar Thermal Exam preparation training for the Interstate Renewable Energy Council (IREC).

### David Del Vecchio
### Photovoltaics

David began installing photovoltaics in 1998 and has designed and installed off-grid, stand-alone solar/wind hybrid systems to straight grid-tied systems without batteries. During this period he lived off-grid for 5 years.

In 2005, David earned a NABCEP PV Installer certification. He is the owner of Solar Seed, a consulting/design company assisting in bringing PV projects from concept through design drawings to commissioning. He also teaches PV at Central Carolina Community College, and for Solar Energy International based in Colorado.

> "The course was very interesting, helpful and appropriate for basic knowledge and the solar enthusiast."
>
> — Christopher Scott,
> Electrician, Castle Hayne, NC

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# RENEWABLE ENERGY II:

SOLD OUT!

## Basics of Business and Technology of Photovoltaics

**September 14-18, 2009**

**McKimmon Conference & Training Center, NC State University, Raleigh, NC**

### First day: Basics of PV Business

- Solar energy economics
- Popular financing mechanisms for solar
- Components involved in financial models
- Solar production estimating, solar degradation, financial tools available
- Sales and business strategies
- Calculating payback
- Trends in solar finance
- Federal and state policies and incentives

### Last 4-days: PV Workshop

- Solar resource siting
- Electric load analysis
- PV modules
- Batteries, inverters, controllers
- Basics of PV design and electric generation
- Sizing stand-alone systems
- Grid tied systems
- Installation, maintenance and servicing techniques
- Hands-on assembly
- Optional: NABCEP entry-level exam

# RENEWABLE ENERGY III:

## Basics of Business and Technology of Solar Thermal

**November 9-13, 2009**

**McKimmon Conference & Training Center, NC State University, Raleigh, NC**

- Overview of solar economics
- Assessing solar sites
- Safety considerations
- Permitting and license requirements for ST
- ST application
- Solar heating water heating (SHW) system types
- SHW components
- Mounting and roof penetrations
- Piping and flow rates
- Solar domestic hot water (SDHW) system sizing software and economics
- Certifications SRCC OG100/OG300
- Systems start-up document transfer and O&M manuals
- SGHW installations
- Heating swimming pools
- Hands-on and/or tour of SHW systems

**For content and more information, contact . . .**
**Maria_OFarrell@ncsu.edu, 919.513.0775.**

# RENEWABLE ENERGY IV:

## Renewable Electric Generation with Photovoltaics

**November 30 – December 4, 2009**

SOLD OUT!

**December 14 – 18, 2009**

**McKimmon Conference & Training Center, NC State University, Raleigh, NC**

### First day: Basics of Electricity

- Sources and types of electricity
- Electrical safety
- Electrical terms, definitions, formulas
- Introduction to direct and alternating current
- Electric circuits
- Different electrical applications
- Ohm's Law
- Hands-on coursework on direct current and magnetism
- Quick overview of solar economics and PV modeling tools

### Last 4-days: PV Workshop

- Solar resource siting
- Electric load analysis
- PV modules
- Batteries, inverters, controllers
- Basics of PV design and electric generation
- Sizing stand-alone systems
- Grid tied systems
- Installation, maintenance and servicing techniques
- Hands-on assembly
- Optional: NABCEP entry-level exam

## Fee per Program

$799–NC residents–
$1,499+–non-NC residents

**Effective December 2009:**

$899–NC residents–
$1,599+–non-NC residents

+10% discount for each additional registration from the same company, and for small business owners

Discounts cannot be combined.

**Please note:** Due to increased demand for our PV courses, only a 50% reimbursement will be given for cancellations made within 10 days of the start date. No credit or reimbursements will be issued for cancellations once classes have begun.

## Introduce Your Company to Our Students!

We offer opportunities for companies to introduce their products and services to our participants. By sponsoring a class, your company can host an after-class reception and/or place your company logo on our marketing materials to reach renewable energy enthusiasts in North Carolina and beyond.

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## DIPLOMA SERIES

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## RET Logistics

### Class Schedule

8:00 – 8:30 a.m.
Check-in/breakfast

8:30 a.m. – 5:00 p.m.
Class hours

Morning and afternoon breaks

Noon – 1:00 p.m.
Networking luncheon

### Credits You Can Earn

Individuals satisfactorily completing each one-week course will be awarded 3.5 CEUs and 35 PDHs and AIA LUs.

### Where to Stay

Lodging and evening meals are not included. To view accommodations near the McKimmon Center, visit **www.mckimmon.ncsu.edu** or call **919.515.2261**

### If you are a person with disability…

and desire any assistive devices, services or other accommodations to participate in these courses, email **ContinuingEducation@ncsu.edu** or call **919.515.2261** during business house (8 a.m. to 5 p.m. EST) at least two weeks in advance.

## WHAT RECENT GRADUATES SAID

"I thoroughly enjoyed the PV class. It provided me with lots of good project ideas for our campus."

—Glen Mowery, Director, Utilities & Energy Management, University of Iowa

"The course was interesting and informative, it will help me succeed in the next generation of residential construction."

—Chris Nemec, Manager, Nemec Construction, LLC., Asheville, NC

"I thought the RETDS was very informative and worthwhile for anyone to take. But for those who are going to design and install these systems, it should be required."

—James Hutchinson, Industrial Technologies Division Director, Roanoke-Chowan Community College

# ALSO AVAILABLE TO YOU

## Green Building Diploma Series

The North Carolina Solar Center at NC State University offers the Green Building Diploma Series (GBDS), tailored specifically for building professionals. The program teaches the necessary skills and information to help architects, engineers, general contractors and others in the building profession get involved with the rapidly growing market for high-performance and sustainable buildings in both the commercial and residential sectors.

**For more information**
on the Green Building diploma, please visit our website,

http://ContinuingEducation.ncsu.edu/green_building_series.html

### How to Complete Your Green Building Diploma

**Complete three week-long Green Buildings workshops:**
(70 contact hours)

- GB I: Designing and Building a Sustainable Home or Small Building
- GB II: Designing and Building Commercial Green Buildings 1
- GB III: Designing and Building Commercial Green Buildings 2

**OR**

**Complete two GB workshops and one week-long Renewable Energy workshop:** (35 contact hours)

- Photovoltaics (Business/Electricity)
- Electric Generation with Wind or Photovoltaics
- Business Basics and Technology of Solar Thermal