August 2012

eRenewable Resource Institute School Catalog

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ABOUT ERENEWABLE RESOURCE INSTITUTE

eRenewable Resource Institute is Arizona State licensed and an IREC ISPQ Continuing Education Provider™ that specializes in renewable energy and green building vocational training. eRenewable Resource Institute is an approved provider for the NABCEP® Entry Level PV Exam and the BPI Building Analyst Exam.

ADMINISTRATION

Donna Marie Bertault, *President and CEO*

Donna Marie Bertault has over 20 years in the recruiting trade and as a skilled professional in the construction industry. In an effort to find jobs for workers who were displaced due to the economic downturn of 2008, Donna Marie sought a local source of renewable energy training. Finding no suitable training providers, Donna Marie formed eRenewable Resource Institute to realign the skill set of our workforce with the renewable energy sector. As President and CEO, Donna continues her quest to bring quality job training programs to the Southwest and launch careers in the renewable energy and building performance industry.

Alix Monty, *Curriculum Director*

Guadalupe Quevado, *Lead Administrator*

FACULTY

Jim Baxter, *Engineer and Photovoltaic & Solar Thermal System Designer*

James Eastman, *Photovoltaic System Installer and Designer*

Jennifer Izzo, *Sustainability Consultant and Educator*

Bob Rees, *Photovoltaic Acquisitions and Sales Manager*

Mercedes Robles, *Consultant and Home Performance Contractor*

MISSION STATEMENT

eRenewable Resource Institute provides a comprehensive, intensive educational experience that prepares graduates to succeed in the renewable energy and building performance industries.

NOTICE OF DISCLAIMER

eRenewable Resource Institute reserves the right to amend programs, policies, tuition, calendar and/or facilities with 14 days prior notice. The School Catalog is prepared for the purpose of furnishing prospective students and other interested persons with information about the school, its policies, and its management.

School Policies

Statement of Non-Discrimination

eRenewable Resource Institute does not discriminate against any person on the basis of race, color, creed, national origin, gender, sexual orientation, religion, age, disability, or other legally protected status, in admission to, access to, or operations of any program, service, or activity. eRenewable Resource Institute does not discriminate on the basis of these criteria in its hiring and employment practices.

Commitment to Professionalism and Quality

eRenewable Resource Institute commits to professionalism and quality practice in all aspects of our school. eRenewable Resource Institute holds its staff to the highest standards of conduct and pledges that all students will be treated in an ethical and professional manner.

Conflict of Interest Disclosure

eRenewable Resource Institute will ensure impartiality on the part of our administration and faculty by disclosing any real or perceived conflicts of interest and adhering to the student grievance procedure listed below. eRenewable Resource Institute employs trainers and proctors who may work as contractors in the building performance industry. Although our trainers and proctors provide evaluation and testing to professionals from other organizations in this industry, our staff pledges to treat all students with impartiality and fairness.

Confidentiality and Release of Information

Our administration and faculty commit themselves to safeguarding the confidentiality of student information obtained in the course of program activities. Personal information about a particular applicant or student will be released only with the written consent of the subject person unless otherwise required by law, in which case the subject will be informed beforehand to whom and what information will be released.

Student Conduct

Students must adhere to the rules and regulations of eRenewable Resource Institute. The student must adhere to conduct that will not interfere with the learning process of any other students, the classroom presentation by the instructor, presentations by visitors, or the progress of the class or eRenewable Resource Institute in general. The administration of eRenewable Resource Institute reserves the right of judgment, to place on probation and/or terminate a student on any of the following grounds:

1. Non-conformity of rules and regulations of the school,
2. Conduct that is unsatisfactory to the school, its staff, faculty, and its students,
3. Unsatisfactory academic progress,
4. Excessive absences or tardiness,
5. Falsifying school records,
6. Breach of school enrollment agreement,
7. Failure to pay fees when due and/or to make available required documents,
8. Entering school premises while under the influence of alcohol or drugs,

9. Carrying a concealed or potentially dangerous weapon,
10. Aiding, abetting, or inciting others to commit any act that would detract from the normal operation of the school,
11. Theft, or
12. Cheating on tests or exams.

Dress Code

Students are to be properly attired at all times, no excessively loose clothing, no shorts, no tank tops, and no open-toed shoes.

Student Grievance Procedure

eRenewable Resource Institute endorses the following student grievance procedure:

1. Complaints directed at an individual instructor or staff member must be discussed directly with the individual involved.
2. If one-on-one discussion fails to result in a satisfactory resolution, a written complaint must be submitted to the President. The President must respond to the complaint, in writing within 24 to 48 hours, excluding Saturday, Sunday and State and Federal holidays.
3. If the student is not satisfied with the proposed resolution, the student must respond to the President, in writing, within 24 to 48 hours, excluding Saturday, Sunday and State and Federal holidays. The President will issue a final written response to the student within three business days, excluding Saturday, Sunday, and State and Federal holidays.

If the complaint cannot be resolved after exhausting this grievance procedure, the student may file a complaint with the Arizona State Board for Private Postsecondary Education. The student must contact the State Board for further details. The State Board address is 1400 W. Washington St., Room 260, Phoenix, AZ 85007, phone # 602-542-5709, website address: www.ppse.az.gov.

Cancellation Policy

eRenewable Resource Institute reserves the right to cancel a course without prior notice for any reason. Grounds for cancellation include an insufficient number of students, instructor illness or emergency or other unforeseen circumstances. When the school must cancel a course, students may register for the next available course date or receive a full refund of the tuition minus the registration fee. Refunds are issued within 30 days of the cancellation.

Academic Policies

Admissions Requirements

eRenewable Resource Institute considers an applicant to be enrolled as a student when he/she has met the following criteria:

1. Signed an enrollment agreement,
2. Certify that he/she is a high school graduate or has a GED, and
3. Made arrangements to the satisfaction of School officials for payment of tuition.

Advanced Placement for Previous Training

eRenewable Resource Institute evaluates credit for previous education, training, and / or work experience, on a case by case basis. The President of eRenewable Resource

Institute is the authority in granting of credits or advanced placement.

ACADEMIC ADVISING

A student's educational objectives, grades, attendance and conduct are reviewed on a regular basis. If a student's academic standing or conduct is unacceptable, the student is advised. Failure to improve academic standing or behavior may result in further action, including termination. Students are encouraged to seek academic advising through their instructor.

GRADING SYSTEM

Students are awarded a letter grade and grade point average (GPA) at the completion of each course. Grades are based on assignments, quizzes, and examinations.

The grading scale is as follows:

ALPHA	NUMERIC	GRADE POINT
A	90 – 100	4.0
B	80 – 89	3.0
C	70 – 79	2.0
D	60 – 69	1.0
F	00– 59	0.0

The student's GPA is calculated by dividing the total amount of grade points earned by the total amount of credits attempted. For the purpose of calculating GPA, each course offered at eRenewable Resource Institute is assigned 1.0 credit. The student's grade point average may range from 0.0 to a 4.0.

SATISFACTORY ACADEMIC PROGRESS

Satisfactory academic progress is defined as maintaining a minimum satisfactory grade point average of 2.0. In the event that a student does not achieve the standard for satisfactory progress, the student will be allowed to present justification or evidence of extenuating circumstances as to why he/she should be allowed to continue training. If the student has not achieved the standards as set forth in this section at the end of the probationary period, he/she may be terminated from the training program.

Students may be required to repeat a course due to failure to maintain satisfactory academic achievement. If a student must repeat a section of study, he/she will be charged a $50 reentrance fee per course as well as tuition fees as determined by eRenewable Resource Institute. The maximum period allowed for re-enrollment will be determined by eRenewable Resource Institute. The student's grade earned during re-enrollment will replace previously earned grade.

MAKE-UP WORK

Assignments and projects not completed on schedule during a course must be made-up within the time frame of that course and with prior approval of the instructor in order to comply with course requirements.

COURSE INCOMPLETES

eRenewable Resource Institute does not award "incomplete" status as a final grade. At the end of a course a student may, with the President's approval, be granted an extension. This extension of time to complete all the required course work and assignments is determined by eRenewable Resource Institute. The extension cannot be used to make-up accrued absences from class. If the student does not complete the required course work and assignments within the extension period, he/she will receive a grade of "F" or zero, which will be averaged with the student's other grades to determine his/her grade point average.

TRANSCRIPTS

Students may request one copy of their official transcript at no cost by submitting a written consent to release of information to the school with the name and address where the transcript will be mailed. A fee will be charged for additional copies and must be paid before the transcript request will be processed. Transcripts sent directly to the student will be marked to indicate that they are unofficial copies. Official transcripts will not be released for students who may have a past due account with the school.

ATTENDANCE POLICY

Program completion is based upon student attendance only. Upon completion of the program, the student is awarded a Certificate of Completion.

Student attendance is calculated based on clock hours. eRenewable Resource Institute does not award semester or quarter credit hours.

Students are required to maintain a minimum of 80% attendance over the length of the program. Students who fall below 80% attendance are placed on attendance probation until they reach 80% attendance or can no longer achieve the 80% attendance by the end of his/her program, at which time the student must make arrangements with the School to complete his/her program of study. Failure to make such arrangements may result in termination. Students who are on attendance probation are considered to be making satisfactory academic progress.

Students may be required to re-enroll due to failure to meet minimum attendance requirements. If a student must repeat a section of study, he/she will be charged a $50 reentrance fee per course as well as tuition fees as determined by eRenewable Resource Institute. The maximum period allowed for re-enrollment will be determined by eRenewable Resource Institute.

TARDINESS/ABSENCE

If a student must be absent or tardy, he/she must call the school within thirty (30) minutes prior to class start time. Student absence, including absence due to tardiness and/or leaving class early, is subtracted from the student's total contact hours with the instructor and is counted against the 80% minimum required attendance.

LEAVE OF ABSENCE

Leaves of absences, including military leaves, shall be reasonable in duration, not to exceed thirty (30) calendar days and must be for specific and acceptable purposes. A written request for leave of absence properly dated and signed by the student and school official must be filed prior to the beginning of such a leave unless circumstances prevent completion of the request at that time. Student must return on or before the expiration of the leave of absence or he/she will be terminated.

TERMINATION PROCEDURE

In the case of termination, the student is notified in writing and may appeal the decision within three (3) days of the "Notice of Termination". Appeals for reinstatement will be reviewed by the President, whose decision is final. If student is not satisfied with the decision, the student may submit to the Student Grievance Procedure listed below.

REENTRANCE

Students who have been forced to withdraw for any reason may request reentrance. Students who were making satisfactory academic progress when they withdrew will be eligible for reentrance without condition. Students who were not making satisfactory academic progress prior to withdraw may be placed on academic probation or have other conditions placed on their reentrance, under the discretion of the President. All students requesting reentrance will be required to go through a portion of the admissions process again. A $50 reentrance fee per course as well as tuition fees as determined by eRenewable Resource Institute may be charged to reinstated students.

Graduation Requirements

In order to graduate, the Student must:

1. Maintain a minimum 80% attendance rate,
2. Return all property belonging to the school, and
3. Fulfill all financial obligations to the school.

Job Placement

eRenewable Resource Institute does not guarantee job placement.

Campus Locations

Main Office

eRenewable Resource Institute
4001 E. Broadway Rd., Suite B-20
Phoenix, AZ 85040
PH. (480) 446-0400
FX. (866) 378-3878
TF. (866) 737-4473
http://www.erenewableresource.com

This is the main office and primary contact for course registrations. This campus has all of the equipment and facility services necessary for conducting the training of all of the courses that we offer.

CERTIFICATIONS AND ACCREDITATIONS

INTERSTATE RENEWABLE ENERGY COUNCIL™

eRenewable Resource Institute has been awarded certification by the Interstate Renewable Energy Council (IREC) as an Institute for Sustainable Power Quality (ISPQ) Continuing Education Provider for the following classes:

- PV100: Solar Installation
- PV150: Solar Installation Lab
- PV200: Advanced Solar Design

NORTH AMERICAN BOARD OF CERTIFIED ENERGY PRACTITIONERS

eRenewable Resource Institute is a NABCEP® Entry Level Photovoltaic Program Provider. Entry level programs at this school do not satisfy experience requirements for other certifications, licenses, or endorsements related to the solar industry or the NABCEP® Photovoltaic Installer certification. PV100: Solar Installation is the only course which qualifies a student for the NABCEP® Entry Level Exam.

eRenewable Resource Institute is also a provider of a registered NABCEP Continuing Education course. Our PVS250 PV Technical Sales course provides 40 contact hours of continuing education credit to NABCEP certified PV Installers and Solar Heating Installers.

U.S. GREEN BUILDING COUNCIL

eRenewable Resource Institute is a U.S. Green Building Council (USGBC) member organization. USGBC's national members are organizations across the globe which share the goal of a more sustainable built environment. Our LGA100: LEED Green Associate course addresses green building principles and qualifies students to take the challenging exam to become accredited LEED Green Associates.

BUILDING PERFORMANCE INSTITUTE

eRenewable Resource Institute is a BPI Test Center. Our Building Analyst and Weatherization Technician program prepares students to pass the rigorous exam to become a BPI certified Building Analyst. We offer the written and field exam for BPI Building Analyst.

TUITION

TUITION SCHEDULE

Program	Hours	Program Fee	Exam Fee	Book Fee	Total
Building Analyst Weatherization Technician	88	$2,590	$500	$80	$3,170
LEED Green Associate - Accelerated	16	$550	-----	$175	$550
LEED Green Associate	32	$1,295	-----	$175	$1,295
Photovoltaic Installer	104	$3,185	$145*	-----	$3,330
Photovoltaic Installer & Technical Sales	144	$3,985	$145*	-----	$4,130
Photovoltaic System Designer	80	$2,190	$145*	-----	$2,335
Photovoltaic Technical Sales	120	$3,145	$145*	-----	$3,290
Solar Thermal Installer	80	$3,095	-----	$200	$3,095

*Exam Fee is Optional

PAYMENT OF TUITION

Students may pay for tuition with cash, personal check, Paypal, credit card or debit card. The student must satisfy all financial obligations to eRenewable Resource Institute in order to receive their Certificate of Completion. Registration fee must be paid before the commencement of the first class.

SCHOLARSHIPS

eRenewable Resource Institute does not offer a scholarship program, provide any loans or grants, and does not assist with living expenses.

PAYMENT PLAN

Students may pay in full before the program commences or choose one of the following payment plans. Program payment plans are available to all students.

Payment plans for each program are as follows:

Program	Before the commencement of course/exam				
	Amount to be paid				
Building Analyst Weatherization Technician	WX150	BPI100			Exam
	$1,295	$1,375			$500
Photovoltaic Installer	PV100	PV150	PV200		Exam*
	$1,145	$995	$1,045		$145
Photovoltaic Installer and Technical Sales Program	PV100	PV150	PV200	PVS250	Exam*
	$1,145	$995	$1,045	$800	$145
Photovoltaic System Designer	PV100		PV200		Exam*
	$1,145		$1,045		$145
Solar Technical Sales	PV100	PV200	PVS250		Exam*
	$1,145	$1,045	$955		$145
Solar Thermal Installer	SHW125	Textbook	SHW125		SHW175
	$1,545	$200	$925		$625

*Exam Fee is Optional

REFUND POLICY

Students who withdraw or are terminated by eRenewable Resource Institute are entitled to a prorated refund. No refund will be issued after the halfway point for the program (50% of the contact hours have expired). Prior to 50% completion of each program, refunds are calculated according to the formula:

$$\text{total refund} = \frac{(\text{total contact hours} - \text{contact hours expired at withdrawl date})}{\text{total contact hours}} \times \text{tuition paid}$$

Withdrawal dates are determined by the last date of attendance, or in the case of a student not returning from an authorized Leave of Absence (LOA), the date the student was scheduled to return from the LOA and did not return. All refunds will be issued within thirty (30) days of receiving the notice of cancellation from the student or the withdrawal date.

THREE-DAY CANCELLATION

An applicant who provides written notice of cancellation within three (3) days (excluding Saturday, Sunday and federal or state holidays) of signing an enrollment agreement and before the commencement of the program is entitled to a refund of all monies paid. No later than 30 days of receiving the notice of cancellation, the school shall provide the 100% refund.

OTHER CANCELLATIONS

An applicant requesting cancellation more than three days after signing an enrollment agreement and making an initial payment and returning all materials and textbooks, but prior to the commencement of the program, is entitled to a refund of all monies paid minus the $50 registration fee per course.

WITHDRAWALS

A student choosing to withdraw from the school *after the commencement of classes* is to provide written notice to the Administration of the school. The notice is to indicate the expected last date of attendance and must be signed and dated by the student. For a student who is on authorized Leave of Absence, the withdraw date is the date the student was scheduled to return from the Leave and failed to do so. A student will be determined to be withdrawn from the institution if the student has not attended any class for 30 consecutive class days. All refunds will be issued within 30 days of the determination of the withdrawal date.

FEES

REGISTRATION FEE

There is a one-time non-refundable registration fee of $50 per program. Registration fee is fully refundable only if an applicant provides written notice of cancellation within three (3) days (excluding Saturday, Sunday and Federal or State holidays) of signing an enrollment agreement and before the commencement of classes.

REENTRANCE FEE

A $50 reentrance fee applies when a student is readmitted after being forced to withdraw for any reason including a failure to maintain satisfactory academic progress or to meet the minimum attendance requirements. Reentrance fee is nonrefundable.

BOOKS FEE

Book fees vary and are not refundable once the student accepts delivery. Students will be informed of any required textbooks at the time of registration. eRenewable Resource Institute supplies textbooks for purchase on the first day of class. Students may bring their own textbooks, and should alert eRRI if they have obtained textbooks on their own.

EXAM FEE

NABCEP® Entry Level Exam - $145

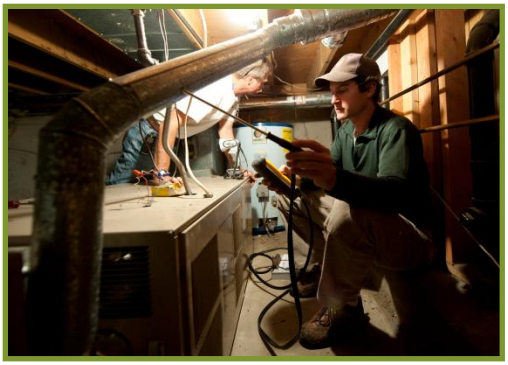
BPI Building Analyst Exam - $500

TRANSCRIPT REQUEST FEE

The first transcript is available at no cost. Each additional transcript request will cost $10.

PROGRAMS

BUILDING ANALYST WEATHERIZATION TECHNICIAN PROGRAM



PREREQUISITE: High School Diploma or GED. Construction experience is helpful but not required.

CLOCK HOURS: 88

PROGRAM DESCRIPTION: This program prepares the novice for entry in the field of residential building analysis, energy auditing, and weatherization for home interiors. Successful completion of a written and field examination at the conclusion of BPI100 certifies the student as a BPI Building Analyst.

UPON COMPLETION: A Certificate of Completion will be issued to graduates, and students are eligible to obtain their BPI Building Analyst Certification at the completion of BPI100.

COURSES:

WX150 Weatherization Techniques	40 hours	5 day intensive
BPI100 Introduction to Building Science	48 hours	6 day intensive

Textbook: *Residential Energy: Cost Savings and Comfort for Existing Buildings*, Krigger and Dorsi. ISBN 978-1880120125.
BPI Building Analyst Exam offered after BPI100

PROGRAM OBJECTIVES:

- Walk the building construction walk in home performance contracting
- Apply the fundamentals of air, heat and moisture flow in remodeling existing homes to make them more efficient, safe, healthy, durable and comfortable
- Identify energy efficiency improvements that are cost effective and what commonly promoted improvements are not cost effective
- Practice techniques for proper duct sealing
- Identify the changes that often occur in building materials and that impact energy efficiency improvements
- Understand how federal, state, and local laws regarding asbestos and lead based paint impact weatherization work
- Recognize priorities for air sealing
- Identify which materials to use in various applications of air sealing, including attic by-pass, air handlers, windows, fireplace chimneys, large cracks and holes
- Perform electrical and gas appliances energy consumption testing
- Understand drainage planes and how to prevent water intrusion
- Basic techniques of insulation installation
- Prevent carbon monoxide health hazards
- Properly use personal protective equipment
- Calculate and install needed ventilation
- Solve problems caused by pressures imbalances
- Determine most effective weatherstripping for doors and windows
- Implement common mobile home weatherization techniques
- Explain landscaping for shade and low water use in desert environments
- Implement post-repair testing to determine if weatherization goals were achieved
- Use building construction terminology common to home performance contracting
- Understand the basic principles of energy
- Explain and calculate the different types of heat flow
- Apply the first and second laws of thermodynamics in residential construction
- Qualify thermal performance in diverse building assemblies
- Perform combustion safety testing to BPI Standards
- Identify heating and air conditioning system types and recognize common HVAC issues
- Test envelope and duct leakage using a blower door and pressure pans
- Successfully perform construction math measurements and calculations
- Test appliance annual kWh usage
- Identify potential health and safety issues that commonly impact home performance contracting
- Explain diagnostic test findings to homeowners
- Properly use a gas leak detector, CO probe, static pressure probe, and monometer
- Identify causes of pressure imbalances
- Determine the effectiveness of insulation
- Diagnose air leakage and determine which leaks to fix and the best way to make the repairs
- Use appropriate techniques to determine the air barrier and thermal boundary of a building

LEED GREEN ASSOCIATE PROGRAM

PREREQUISITE: High School Diploma or GED. Construction or design experience is helpful but not required.

CLOCK HOURS: 16 or 32

PROGRAM DESCRIPTION: Our LEED Green Associate program provides students with a comprehensive approach to sustainability, green building practices, and the intricacies of the LEED® Rating Systems. This program is designed for students from a wide range of backgrounds including all areas of construction, real estate sales, interior design, architecture or engineering to pass the rigorous third-party exam to obtain the LEED Green Associate accreditation.

UPON COMPLETION: A Certificate of Completion will be issued to graduates, and students are eligible to obtain their LEED Green Associate accreditation.

COURSES:

LGA100A LEED Green Associate - Accelerated 16 hours 2 day intensive

Textbook: *Green Associate Study Guide and Green Building & LEED Core Concepts Guide, 2nd edition (available at www.usgbc.org/store); See list of Primary References below.*

LGA100 LEED Green Associate Course 32 hours 4 day intensive

Textbook: *Green Associate Study Guide and Green Building & LEED Core Concepts Guide, 2nd edition (available at www.usgbc.org/store); See list of Primary References below.*

PROGRAM OBJECTIVES:

- The big picture of sustainability
- Integrative design
- Overview of green operations
- Costs and benefits of green building
- Introduction to USGBC, GBCI and LEED®
- LEED® rating systems
- Determining project feasibility
- Basic LEED® project information
- LEED® certification process
- Sustainable Sites
- Water efficiency
- Energy and atmosphere
- Indoor environmental quality
- Innovation in LEED® design and operations
- Regional issues in LEED® design
- LEED® credentials and exam information

PRIMARY REFERENCES:

- LEED® Green Associate Candidate Handbook (available at http://www.gbci.org/Libraries/Candidate_Handbooks/LEED_Green_Associate_Candidate_Handbook.sflb.ashx)
- Green Associate Study Guide and Green Building & LEED Core Concepts Guide, 2nd edition (available at www.usgbc.org/store)
- Green Office Guide: Integrating LEED® Into Your Leasing Process, Section 2.4**
- LEED® 2009 for New Construction and Major Renovations Rating System **
- LEED® for Existing Buildings: Operations & Maintenance Reference Guide, Introduction **
- LEED® for Existing Buildings: Operations & Maintenance Reference Guide, Glossary **
- LEED® for Homes Rating System **
- Guidance on Innovation & Design (ID) Credits **
- Credit Interpretation Rulings **
- LEED® 2009 Minimum Program Requirements **
- Sample LEED® V2 Templates (available at http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1447)
- Treatment by LEED® of the Environmental Impact of HVAC Refrigerants **
- Guide to Purchasing Green Power (available at http://www.gbci.org/Libraries/Credential_Exam_References/Guide-to-Purchasing-Green-Power.sflb.ashx)
- Cost of Green Revisited **
- Sustainable Building Technical Manual: Part II **
- LEED® 2009 for Operations & Maintenance Rating System **

** Links to documents available in LEED® Green Associate Candidate Handbook (available at http://www.gbci.org/Libraries/Candidate_Handbooks/LEED_Green_Associate_Candidate_Handbook.sflb.ashx)

PHOTOVOLTAIC INSTALLER PROGRAM

PREREQUISITE: High School Diploma or GED. Construction and/or electrical experience helpful but not required.

CLOCK HOURS: 104

PROGRAM DESCRIPTION: This program provides the skills necessary to solar industry novices and experienced tradespersons to begin as an entry-level solar photovoltaic installer working under supervision in residential or commercial environments. This program prepares and qualifies the student for the NABCEP Entry-Level Photovoltaic Exam. Training program satisfies educational requirements only, and does not provide experience necessary for other certifications, licenses, or endorsements related to solar installation. All courses in the solar installer program are certified as a continuing education courses by the Interstate Renewable Energy Council (IREC).

UPON COMPLETION: A Certificate of Completion is issued to graduates, and students are eligible to challenge the NABCEP Entry Level Photovoltaic Exam at the completion of PV100.

COURSES:

PV100 Basic Solar Installation and Design	40 hours	5 day intensive
PV150 Solar Installation Lab	24 hours	3 day workshop
PV200 Advanced Solar Design	40 hours	5 day intensive

PROGRAM OBJECTIVES:

- Perform power and energy calculations
- Perform a load analysis for off-grid and battery-less grid-tied systems
- The study of electrical efficiency measures to reduce system size
- Diagram an array and battery bank in series and parallel configurations
- Determine and apply module specifications
- Determine module performance and array performance given various conditions
- Determine the azimuth and altitude angle of the sun and evaluate shading potential
- List the pros and cons of different mounting solutions
- Interpret and apply data from equipment specification sheets
- Analyze net metering and other incentives that affect the final cost of PV system
- Diagram an array in series and parallel configurations
- Size appropriate disconnects and overcurrent protection
- Discussions on specifications for a given module and determine a module's performance given various environmental conditions
- Determine performance of an array/system based on irradiance changes or for array orientation and tilt angle at a given site
- Determine the magnetic declination, find the orientation and altitude angle of the sun, and evaluate the shade potential for a given site
- Read equipment specification sheets to determine the critical information needed in system design
- Size a residential grid-direct system including the inverter, array, PV source and inverter output circuit conductors (basic) and overcurrent protection
- Determine the number of modules that can fit on a given roof space
- Identify the following wires and components on a three-line diagram of a residential grid-direct system: the array, disconnects, inverters, the equipment grounding conductors, ungrounded conductors, grounded conductors, the grounding electrode(s) and the system grounds
- List the order of commissioning and potential safety hazards for grid-direct
- Perform NEC service panel bus bar calculations
- Calculate and diagram appropriate series fusing
- Determine NEC required workspace clearances
- Size appropriate disconnects and overcurrent protection
- Calculate spacing between modules to eliminate inter-row shading
- Perform uplift force and lag bolt strength calculations
- Identify all required NEC labeling for solar-electric systems
- Size grounding wires and grounding electrode conductors to NEC standards
- Draw a three-line diagram of a residential grid-tied system and a residential battery-based system
- Identify the sizing considerations for stand-alone systems
- Perform sizing calculations for a battery-based system
- Calculate maximum charge rates for batteries
-

PHOTOVOLTAIC INSTALLER & TECHNICAL SALES PROGRAM

PREREQUISITE: High School Diploma or GED. Construction and/or electrical experience helpful but not required.

CLOCK HOURS: 144

PROGRAM DESCRIPTION: This combined program provides the skills necessary for solar industry novices and experienced tradespersons to learn the how, why and what of solar technology. Solar technical sales and assessment class teaches students to perform site analysis, financial analysis, initial system design and more. This program prepares and qualifies the student for the NABCEP Entry-Level Photovoltaic Exam. Training program satisfies educational requirements only, and does not provide experience necessary for other certifications, licenses, or endorsements related to solar installation.

UPON COMPLETION: A Certificate of Completion is issued to graduates, and students are eligible to challenge the NABCEP Entry Level Photovoltaic Exam at the completion of PV100.

COURSES:

PV100 Basic Solar Installation and Design	40 hours	5 day intensive
PV150 Solar Installation Lab	24 hours	3 day workshop
PV200 Advanced Solar Design	40 hours	5 day intensive
PVS250 PV Technical Sales	40 hours	5 day intensive

PROGRAM OBJECTIVES:

All of the objectives covered in the Photovoltaic Installer Program plus:

- Determine the appropriateness of a prospective solar electric system following an evaluation of the client's site and needs
- Address any specific concerns over owning, operating and maintaining a PV system
- Assess the prospects' anticipated budgetary expectations and financial capacity to purchase or lease a PV system
- Prepare and deliver the ball park estimate
- Perform an electrical service inspection
- Identify system component locations
- Evaluate the structural integrity of potential mounting locations
- Quantify the location's solar resources
- Establish a conceptual design to accurately estimate the cost of a PV system during the sales process
- Review project goals against various design considerations
- Determine the net cost and savings of a project in order to analyze its economics
- Use project cost, location, incentive availability and local utility to provide a total system cost, net system cost after incentives are applied and estimated electric bill savings
- Provide a financial benefit analysis and clear understanding of financing methods/options in order to give the client the economic rationale necessary to evaluate an investment in a PV system
- Understand the non-financial motivations for a client's interest in a PV system and effectively communicate the benefits of solar electricity to the customer
- Estimate and explain initial and over-time system production and performances
- Deliver a proficient and competent proposal that clearly states realistic power production, contract cost, equipment specifications, financial calculations, incentives, and any other important site specific or local jurisdictional information pertaining to buying a solar energy system

PHOTOVOLTAIC SYSTEM DESIGNER PROGRAM

PREREQUISITE: High School Diploma or GED. Construction, design and/or electrical experience helpful but not required.

CLOCK HOURS: 80

PROGRAM DESCRIPTION: This program enables those who have experience or training in solar installation, engineering, architecture, design or construction to advance or convert their skill set into a solar design-related career i.e., submitting designs to engineers for approval. All courses in the photovoltaic system designer program are certified as continuing education courses by the Interstate Renewable Energy Council (IREC).

UPON COMPLETION: A Certificate of Completion is issued to graduates, and students are eligible to challenge the NABCEP Entry Level Photovoltaic Exam at the completion of PV100.

COURSES:

PV100 Basic Solar Installation and Design	40 hours	5 day intensive
PV200 Advanced Solar Design & Compliance	40 hours	5 day intensive

PROGRAM OBJECTIVES:

- Perform power and energy calculations
- Perform a load analysis for off-grid and battery-less grid-tied systems
- The study of electrical efficiency measures to reduce system size
- Diagram an array and battery bank in series and parallel configurations
- Determine and apply module specifications
- Determine module performance and array performance given various conditions
- Determine the azimuth and altitude angle of the sun and evaluate shading potential
- List the pros and cons of different mounting solutions
- Interpret and apply data from equipment specification sheets
- Size a residential battery-less grid-tied system including the inverter, array, wiring and overcurrent protection
- List the order of commissioning/decommissioning and the potential safety hazards of PV systems
- Identify the proper safety protocols for working with batteries
- Define battery depth of discharge, days of autonomy, equalization and efficiency
- Specifications for charge controller(s)
- Specifications for battery-based inverter(s) given certain parameters
- Determine acceptable voltage drop for system circuits
- Perform detailed site analysis utilizing commercially available tools
- Perform NEC service panel bus bar calculations
- Calculate and diagram appropriate series fusing
- Determine NEC required workspace clearances
- Size appropriate disconnects and overcurrent protection
- Calculate spacing between modules to eliminate inter-row shading
- Perform uplift force and lag bolt strength calculations
- Identify all required NEC labeling for solar-electric systems
- Size grounding wires and grounding electrode conductors to NEC standards
- Draw a three-line diagram of a residential grid-tied system and a residential battery-based system
- Identify the sizing considerations for stand-alone systems
- Perform sizing calculations for a battery-based system
- Calculate maximum charge rates for batteries

PHOTOVOLTAIC (PV) TECHNICAL SALES PROGRAM

PREREQUISITE: High School Diploma or GED. Construction, electrical or sales experience helpful but not required.

CLOCK HOURS: 120

PROGRAM DESCRIPTION: This program builds upon the foundation of core solar installation concepts and allows those new to the industry of solar as well as those who have solar installation experience or sales experience to move into the exciting world of solar sales and assessing. Program content is based directly on the NABCEP Technical Sales Job Task Analysis.

UPON COMPLETION: A Certificate of Completion is issued to graduates, and students are eligible to challenge the NABCEP Entry Level Photovoltaic Exam at the completion of PV100.

COURSES:

PV100 Basic Solar Installation and Design	40 hours	5 day intensive
PV200 Advanced Solar Design & Compliance	40 hours	5 day intensive
PVS250 PV Technical Sales	40 hours	5 day intensive

PROGRAM OBJECTIVES:

All of the objectives in the Photovoltaic System Designer Program plus:

- Determine the appropriateness of a prospective solar electric system following an evaluation of the client's site and needs
- Address any specific concerns over owning, operating and maintaining a PV system
- Assess the prospects' anticipated budgetary expectations and financial capacity to purchase or lease a PV system
- Prepare and deliver the ball park estimate
- Perform an electrical service inspection
- Identify system component locations
- Evaluate the structural integrity of potential mounting locations
- Quantify the location's solar resources
- Establish a conceptual design to accurately estimate the cost of a PV system during the sales process
- Review project goals against various design considerations
- Determine the net cost and savings of a project in order to analyze its economics
- Use project cost, location, incentive availability and local utility to provide a total system cost, net system cost after incentives are applied and estimated electric bill savings
- Provide a financial benefit analysis and clear understanding of financing methods/options in order to give the client the economic rationale necessary to evaluate an investment in a PV system
- Understand the non-financial motivations for a client's interest in a PV system and effectively communicate the benefits of solar electricity to the customer
- Estimate and explain initial and over-time system production and performances
- Deliver a proficient and competent proposal that clearly states realistic power production, contract cost, equipment specifications, financial calculations, incentives, and any other important site specific or local jurisdictional information pertaining to buying a solar energy system

SOLAR THERMAL INSTALLER PROGRAM

PREREQUISITE: 2 Years Plumbing experience or equivalent.

CLOCK HOURS: 80

PROGRAM DESCRIPTION: This program enables those who have experience or training in plumbing to advance or convert their skill set into an entry-level solar hot water related career, working under an experienced plumbing contractor.

UPON COMPLETION: A Certificate of Completion is issued to graduates.

COURSES:

SHW100 Introduction to Solar Thermal and Domestic Hot Water	40 hours	5 day intensive
Textbook: *Solar Hot Water Lessons Learned: 1977 'til Today*, Tom Lane. ISBN 978-1607250623.		
SHW125 Domestic Solar Thermal Installation Lab	24 hours	3 day workshop
SHW175 Domestic Solar Thermal Pool & Active Space Heating	16 hours	2 day intensive

PROGRAM OBJECTIVES:

- Recognize solar thermal opportunities and solutions for various scenarios.
- Use a solar thermal needs assessment to properly size a system.
- Use knowledge of solar thermal radiation to complete an initial site analysis for a solar thermal application.
- Successfully perform a site shading analysis using industry-approved tools.
- Prepare a detailed analysis of the site's solar thermal output using software tools.
- Distinguish solar thermal collectors based on factors such as intended use, design, construction, fluid flows, climate suitability, and performance.
- Identify solar thermal safety practices, standards and codes.
- Explain the SRCC rating and certification system for solar thermal components.
- Identify the proper use of Balance of System components used in a SDHW solution, including freeze protection best practices.
- Describe the various types of residential hot water systems and how they may be incorporated into a solar domestic hot water system.
- Demonstrate understanding of collector mounting options for various roof constructions.
- Complete system documentation and provide client education on safety, operation, maintenance, and emergency shutdown.
- Demonstrate the methods to analyze and troubleshoot solar thermal systems.
- Physically identify the various components of two types of solar thermal systems (Drainback & Glycol based) including collectors, tanks, pumps, temperature sensors, controllers, storage tanks, and heat exchangers.
- Be capable of properly installing each component.
- Pressure test system.
- Complete both fluid charge sequence and procedure for proper system start – up.
- Identify typical operating parameters.
- Review various system faults and complete troubleshooting including repair/resolution.
- Be capable of executing an emergency shutdown procedure.
- Demonstrate proper shutdown for vacation and/or maintenance.
- Be capable of fluid change out as required.
- Complete fully system documentation and provide client education on safety, operation, maintenance, and emergency shutdown.
- Identify the various aspects of solar thermal pool and active space heating opportunities.
- Identify the various types of solar thermal collectors including use, design & construction, fluid flows, and performance.
- Identify each classification for SD pool/spa heating systems, describing each and identifying how they are used.
- Possess a detailed understanding of design, installation, operation, and maintenance for the above mentioned pool/spa systems.
- Identify the various types of active, solar domestic space heating systems.
- Describe the numerous plumbing components used in each application including function, construction, installation, operation, and maintenance.
- Be capable of properly sizing a pool, spa, or active space heating system.
- Be capable of designing and installing piping, electrical, and all other systems necessary to complete a safe, permitted, and operational pool or space heating system.
- Complete fully system documentation and provide client education on safety, operation, maintenance, and emergency shutdown.

COURSE LISTING

BPI100: INTRODUCTION TO BUILDING SCIENCE

Clock Hours: 48
Our Building Science course covers the integrated approach to assessing, correcting, and building residential structures based on the "House as a System" concept. This course prepares students for the Building Performance Institute (BPI) Building Analyst certification exam. It introduces the purpose of an energy audit, the basic skills required and the equipment needed to perform pressure diagnostics, combustion safety testing, and the calculation of minimum ventilation requirements for indoor air quality. Course includes in-depth lectures, practice exams, and an opportunity to challenge the BPI Building Analyst certification exam, both written and field exam included.

LGA100: LEED GREEN ASSOCIATE

Clock Hours: 32
The course provides students with a comprehensive approach to sustainability, green building practices, and the intricacies of the LEED® Rating Systems. It prepares and qualifies students for the LEED Green Associate accreditation exam. The course presents the fundamentals of the whole-building approach to design and construction. Topics include: integrated project team delivery, costs of green, strategies to achieve LEED credit, stakeholder involvement in innovation, and standards that support LEED. The course format will include presentations, exercises, videos, practice questions, and homework assignments.

LGA100A: LEED GREEN ASSOCIATE ACCELERATED

Clock Hours: 16
The course provides students with a comprehensive approach to sustainability, green building practices, and the intricacies of the LEED® Rating Systems. It prepares and qualifies students for the LEED Green Associate accreditation exam. The course presents the fundamentals of the whole-building approach to design and construction. Topics include: integrated project team delivery, costs of green, strategies to achieve LEED credit, stakeholder involvement in innovation, and standards that support LEED. The course format will include presentations, exercises, videos, practice questions, and homework assignments.

PV100: SOLAR INSTALLATION AND DESIGN

Clock Hours: 40
This introductory solar photovoltaic (PV) course provides an overview of the basic PV system applications and builds a fundamental understanding of the core concepts necessary to work with both residential and commercial PV systems. This course prepares and qualifies students for the NABCEP Entry Level PV Exam. Topics include: system components, site analysis, PV module criteria, mounting solutions, safety, and commissioning. Teaching strategies include multimedia lectures, instructor-led exercises related to case studies and basic hands-on exercises. This course is certified as a continuing education course by the Interstate Renewable Energy Council (IREC).

PV150: SOLAR INSTALLATION LAB

Clock Hours: 24

The goal of our Solar Installation Lab is to create a fundamental understanding of the core concepts necessary to work with all PV systems including: system components, site analysis, PV module criteria, mounting solutions, safety and commissioning. This lab is recommended to students who wish to challenge the NABCEP Entry Level PV Exam. Our three-day workshop gives students hands-on experience with penetrating systems on three different rooftops: "S" tile, flat tile and Komp shingle as well as a Ballast system for commercial properties. Students work under direct instruction in our state-of-the-art solar installation lab. Safety equipment and tools are provided and demonstrated. This course is certified as a continuing education course by the Interstate Renewable Energy Council (IREC).

PV200: Advanced Solar Design

Clock Hours: 40
Our Advanced Solar Design course focuses on the design of solar PV systems in compliance with the National Electric Code (NEC). This course is recommended for solar PV installers, designers and technical salespeople. Participants evaluate system performance under various operating conditions and learn to perform grid interface calculations. Topics covered include site analysis, system sizing, grounding considerations, wire sizing, inter-row shading, inverter selection, and data monitoring solutions. Traditional lectures are combined with system design exercises. This course is certified as a continuing education course by the Interstate Renewable Energy Council (IREC).

PVS250: PV Technical Sales

Clock Hours: 40
Extending knowledge of solar PV systems learned from experience or from completion of PV100 and PV200, this course provides the necessary information to provide an accurate industry standard for technical sales. This program prepares students for entry into the occupation of solar sales and adheres to the NABCEP PV Technical Sales Job Task Analysis. Using tools from the industry and examining business, economic, and trend information, students conduct analysis and derive solutions from case studies modeled on real situations. Class format follows a traditional lecture with multimedia components and instructor-led exercises.

SHW 100: Introduction to Solar Thermal and Solar Domestic Hot Water

Clock Hours: 40
This course provides a fundamental working knowledge of the varied aspects of solar thermal collection and its use as a domestic heating source. The student will be prepared for design, installation, operation and maintenance of the most common solar domestic hot water systems (SDHW). Students will significantly increase their plumbing skills to include a detailed understanding of solar thermal and the design/installation/operation of domestic hot water systems. This course also covers solar thermal site analysis, collector roof mounting, safety, code issues, as well as an overview of solar pool and solar space heating.

SHW 125: Domestic Solar Thermal Installation Lab

Clock Hours: 24
This laboratory workshop is designed to provide a detailed, hands-on educational experience of the various components,

installation, and operation of domestic solar thermal systems. The goal of the course is to create a fundamental understanding of the core concepts necessary to work with all solar thermal systems including: design, installation (including permitting), operation, and maintenance of the two most common solar domestic thermal systems (drainback & closed loop glycol).

SHW 175: Domestic Solar Thermal Pool and Active Space

Clock Hours: 16

This course provides a more detailed working knowledge of the varied aspects of domestic solar thermal pool and active space heating. The course further prepares students for design, installation (including permitting), operation, and maintenance of the most common solar domestic thermal pool and active space heating systems. Students will continue to increase their plumbing skills including a more detailed understanding of solar thermal pool and active space heating design/installation/ operation.

WX 150: Weatherization Techniques

Clock Hours: 40

Our Weatherization course provides students with hands-on training in the most commonly needed upgrades to improve residential properties. Students seeking to challenge the BPI Building Analyst certification exam benefit by learning techniques to rectify the energy efficiency, health, comfort and durability issues diagnosed during an energy audit. Topics include: industry standards for weatherization, interpreting an MSDS, writing a scope of work for repairs, and commissioning. The training program provides both classroom and on-site instruction