

Photovoltaic PV101



**SOLAR ENERGY
INTERNATIONAL**

Educate. Engage. Empower.



Alaska Technical Center
June 18-22, 2018

ATC is excited to provide the Photovoltaic 101 Workshop opportunity with our business industry partners:

Solar Energy International, USDA, Southeast Conference, NANA Regional Corporation, KEA, Northwest Arctic Borough

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PV101 Workshop

Solar Energy International to provide the following:

- Customized, in-person technical IREC Accredited training with two SEI instructors. The training counts for educational hours through NABCEP.
- Participant materials including a notebook of lessons, quizzes and exercises, and a Solar Electric Handbook: Photovoltaic Fundamentals and Applications or NEC
- Records of Completion for each person who successfully completes the training.
- SEI will provide limited hands-on training equipment, as needed

Students who complete the PV101 workshop will be able to perform the following:

- Differentiate between various renewable energy sources and types of systems
- Perform power and energy calculations
- Evaluate utility bills and rate plans, perform a load analysis for a grid-direct system, and compare system production to energy consumption
- Describe energy efficiency measures that can be implemented to reduce electricity usage and PV system size
- Analyze different net metering rules, rebates, and incentives that affect the final cost of a PV system
- Diagram and list the features, applications, and components of the following PV system types: DC direct, stand-alone, grid-direct, and grid-tied with battery back-up
- Obtain and apply specifications for PV modules and determine their performance given various environmental and operating conditions
- Identify various types of digital multimeters and explain how to use them safely
- Diagram and determine the power, current, and voltage characteristics of PV modules in different series and parallel configurations
- Determine the magnetic declination, define azimuth and altitude angle and evaluate the shade potential for a given site
- Estimate energy production of a PV system based on location specifics including orientation and tilt angle
- List the pros and cons of different mounting systems (ground, pole, roof, and trackers) and determine the number of modules that can fit in a given roof space
- Given specific site criteria, evaluate what type of inverter is appropriate
- Decipher balance-of-system equipment specification sheets to determine the critical information needed for system design
- Design a residential grid-direct system including the array, inverter, circuit conductors, an overcurrent protection
- Define equipment grounding, system grounding, and components and conductors used for grounding
- Identify the following wires and components on schematics of residential grid-direct systems: disconnects, inverter, equipment grounding conductors, ungrounded conductors, grounded conductors, the grounding electrode(s), and the AC and DC system ground
- Identify potential safety hazards and the proper personal protective equipment for working on grid-direct PV systems
- List the order of installation, commissioning, and decommissioning of a grid-direct PV system