



APPRENTICESHIP LEARNING PATH

SOLAR PV TECHNICIAN

2-Year Program • 4,000 OJL Hours • 288 Training Hours • English & Spanish

1

Core Construction Basics

Competency in construction safety, tool operation, terminology, introduction to electrical concepts, materials handling, professional communication, hazard recognition, and career readiness skills.

2

SPV 2 Introduction to Solar Construction

Solar fundamentals, site safety and assessments, NEC standards, system components and design, roof-mount and ground-mount system basics, grounding and bonding, battery storage and industry trends.

3

SPV 3 Advanced Solar Construction

Advanced NEC compliance, electrical circuits, raceway systems, installation manuals and shop drawings, performance monitoring, utility interconnection points, and project management

4

SPV 4 Advanced PV Installation Professional

Comprehensive professional training covering system design, installation, commissioning, operations and maintenance, includes 58-hour NABCEP PVIP certified training hours.

CAREER READY:

Solar PV Technician • NABCEP Training Hours • First Aid/CPR



Cam Services
Building futures

Solar PV Technician Program

Required Courses

- Core Construction Basics 1
- SPV 2 - Introduction to Solar Construction
- SPV 3 - Advanced Solar Construction
- SPV 4 - NABCEP PV Installation Professional

All courses available in English and Spanish

Wage Progression Schedule

Apprentices must meet the **minimum OJL and RTI hour requirements** listed below to achieve the corresponding apprentice level and prevailing wage.

Level	OJL Hours (min)	RTI Hours (min)	Assigned Courses	Percent of JW Wage
1	0	0	Core Construction Basics	66%
2	1,000	72	SPV 2 - Introduction to Solar Construction SPV 3 - Advanced Solar Construction	77%
3	3,000	216	SPV 4 - NABCEP PV Installation Professional	88%
4	4,000	216		100%
Graduation	4,000	288		100%

Disclaimer: Course topics and schedules are subject to change based on instructor discretion, industry updates, or program improvements. Any adjustments made will maintain the overall educational objectives and core content of the courses.

Core Construction Basics 1

Duration: 19 weeks

Weekly Commitment: 4 hours/week

Total Training Hours: 76 hours

Includes: Online Lectures, Practical Activities, Assessments, and **OSHA10**

Target Audience: Entry-Level Apprentices and Construction Industry Trainees

Course Description

A foundational course designed to introduce participants to the essential knowledge, skills, safety practices, and industry standards required for success in the construction and energy sectors. The course provides a broad overview of construction fundamentals, including jobsite safety, hand and power tools, materials handling, trenching and excavation, hoisting and rigging, construction drawings, applied construction math, and basic electrical theory. Students will also explore the structure of the electrical power industry, renewable energy construction, workplace communication, career development, and professional expectations within apprenticeship programs.

Course Competencies

- Explain apprenticeship expectations and professional behavior.
- Identify jobsite hazards, follow OSHA safety practices, understand workplace safety systems, hazard controls and construction regulations and industry standards.
- Explain basic power generation and distribution systems.
- Safely use and maintain hand and power tools.
- Select, inspect, maintain, and safely use common construction hand tools and power tools according to manufacturer and industry guidelines.
- Recognize hazards associated with heavy equipment operation, excavation, trenching, and crane activities
- Interpret basic construction drawings, blueprints, and specifications. Perform foundational construction math calculations
- Identify construction methods, safety considerations, and workforce opportunities associated with renewable energy projects including solar, wind, biomass, and hydropower systems.
- Develop career readiness skills including résumé preparation, career pathway planning, and understanding of training opportunities within the skilled trades.

SPV 2 - Intro to Solar Construction

Duration: 18 weeks

Weekly Commitment: 4 hours/week

Total Training Hours: 72 hours

Format: Lecture, Online Learning, Practical Activities, and Assessments

Intended Audience: Entry-level solar construction workers and Apprentices

Course Description

The SPV 2 course is designed to provide participants with a comprehensive understanding of solar photovoltaic (PV) systems, including system design, installation, electrical theory, safety practices, maintenance, troubleshooting, and code compliance. Participants will build upon foundational construction and electrical knowledge while developing specialized skills related to residential, commercial, and ground-mounted solar PV systems. The curriculum emphasizes safety, system performance, industry best practices, and emerging technologies such as battery storage and smart energy integration.

Course Competencies

- Solar photovoltaic system fundamentals
- Site assessment and solar access evaluation
- Customer energy needs analysis
- Solar PV system design and layout
- Solar component selection and placement
- NEC compliance and solar regulations
- Inverter operation and integration
- Roof-mounted and ground-mounted PV installation
- Electrical theory for AC/DC systems
- Wire sizing and voltage drop calculations
- Overcurrent protection applications
- Grounding and bonding procedures
- Battery storage systems and energy storage concepts
- PV system maintenance and troubleshooting
- Construction safety and hazard mitigation
- Performance testing and commissioning
- Professional communication and documentation
- Renewable energy industry trends and career readiness

SPV 3 - Advanced Solar Construction

Duration: 18 weeks

Weekly Commitment: 4 hours/week

Total Training Hours: 72 hours

Format: Lecture, Online Learning, Practical Activities, and Assessments and **First Aid/CPR**

Intended Audience: Intermediate-level solar construction workers and Apprentices

Course Description

This advanced Solar PV Technician course series provides comprehensive training in the installation, interconnection, commissioning, operation, maintenance, and leadership aspects of modern photovoltaic (PV) systems. Emphasizing National Electrical Code (NEC) compliance, this course prepares technicians to work across residential, commercial, industrial, and utility-scale solar projects. Learners develop practical, field-based skills in electrical systems, conductor and raceway installation, utility interconnection, advanced diagnostics, commissioning protocols, maintenance strategies, and supervisory leadership.

Course Competencies

- NEC requirements related to solar PV systems, energy storage systems, grounding, bonding, conductors, raceways, and utility interconnections.
- Advanced safety practices, hazard mitigation procedures, and emergency response protocols for solar construction environments.
- Interpretation of equipment installation manuals, shop drawings, construction documents, and project closeout documentation.
- Identifying and evaluating utility interconnection methods, points of connection, and grid integration requirements.
- PV-specific calculations including conductor sizing, voltage drop, load calculations, inverter output, and energy production estimates.
- Utilization of monitoring systems, SCADA platforms, and performance metrics to assess PV system operation and long-term asset performance.
- Commissioning, compliance verification, preventive maintenance, and corrective maintenance procedures for PV systems.
- Effective supervision, leadership, communication, and team coordination skills within solar construction environments.
- Solar market trends, policy drivers, and emerging applications influencing the future of the solar industry.

SPV 4 - NABCEP PV Installation Professional

Duration: 17 weeks

Weekly Commitment: 4 hours/week

Total Training Hours: 68 hours

Format: Lecture, Online Learning, Practical Activities, and Assessments

Intended Audience: Advanced-level solar construction workers and Apprentices. ***Includes 58 NABCEP Certified Training Hours***

Course Description

This course provides comprehensive training in photovoltaic (PV) system installation, commissioning, maintenance, and operational verification in alignment with NABCEP PV Installation Professional (PVIP) Job Task Analysis (JTA) and industry best practices. Participants will develop the technical knowledge and practical skills required to assess project sites, interpret customer and project requirements, configure electrical and mechanical system designs, install PV and battery storage equipment, and perform system testing, commissioning, troubleshooting, and maintenance. The course prepares participants for advanced field responsibilities and supports readiness for NABCEP PV Installation Professional certification.

Course Competencies

- Interpret NABCEP PVIP standards, project specifications, and customer expectations for PV system installations.
- Apply mechanical and electrical design principles to PV and battery storage system configurations.
- Evaluate system monitoring, control, and communication systems for PV installations.
- Explore permits, approvals, project documentation, and code-compliance requirements.
- Adapt PV system designs to field conditions, project constraints, and changing installation requirements.
- Develop safety plans that address electrical, fall, mechanical, and environmental hazards.
- Install raceways, electrical equipment, conductors, grounding, and bonding systems in accordance with NEC and industry standards.
- Install and integrate utility interconnection equipment, monitoring hardware, PV modules, battery systems, and mounting systems.
- Perform installation procedures for both ground-mounted and building-mounted PV systems.
- Knowledge of mechanical and electrical inspections, commissioning procedures, and system performance verification tests.
- Verify proper system operation, document project completion, and orient end users on safe system operation and maintenance. Apply troubleshooting methodologies to diagnose and resolve PV system operational issues safely and effectively.