Solar Black Belt Academy

Commercial Solar + Powerwall Product Knowledge

COURSE SYLLABUS | VERSION 1.0 | OCTOBER 26, 2026



Learn visually. Explain clearly. Verify your answers.

A self-paced pathway for members preparing for commercial solar consultations, equipment discussions and employment consideration. ROI, the solar ninja, guides learners from foundations to an integrated final assessment.

Course scope: 8 belt levels, 24 lesson sections, 144 vocabulary definitions, 72 knowledge questions, 24 written exercises and 8 practical assessments. A separate oral defense completes the proposed Black Belt pathway.

Publication status: Curriculum prepared for technical review and Emergent integration. This syllabus describes the planned academy; it does not confirm that online classes or certification are live.

Your learning pathway

Who this course serves

New solar sales professionals, customer-facing staff and members seeking a structured introduction to commercial solar and Tesla Powerwall product knowledge. No prior electrical trade experience is required for the learning track.

What graduates should demonstrate

- Explain solar generation, conversion, storage, kW and kWh in plain language.
- Read commercial bills and distinguish energy, demand, fixed charges and tariff assumptions.
- Recognize site constraints, hazards and equipment compatibility questions.
- Use model-specific Tesla documents to support a Powerwall consultation.
- Present conditional production and financial estimates with sources and clear limits.
- Complete a documented consultation and identify questions requiring a qualified specialist.

Belt progression and knowledge thresholds

Belt	Focus	Belt exam pass
White	Foundations	80%
Yellow	Electricity	80%
Orange	Equipment	80%
Green	Site and safety	85%
Blue	Commercial bills	85%
Purple	Powerwall	85%
Brown	Analysis	90%
Black	Consultation	90%

Complete levels in order. Safety-critical questions require 100% correct responses. Written work and practical reviews are additional requirements, even when a knowledge score passes.

Study effort and materials

Lesson estimates total about 15.2 hours. Reserve another 8-16 hours for source reading, vocabulary, exercises and assessments; individual pace varies. These are planning estimates, not accredited contact hours. Use an internet-connected device, calculator and access to linked official references.

COURSE SEQUENCE

White + Yellow belts

WHITE BELT

L01 | Your energy team

Photovoltaic modules turn light into electricity. An inverter changes DC electricity into AC.

L02 | Power versus energy

Power describes the rate of energy transfer; energy accumulates over time. A kilowatt is 1,000 watts.

L03 | Customer goals and honest claims

Separate bill reduction, outage resilience, environmental objectives and workforce learning. Document priorities in the customer's words.

Apply it: Explain the system. Record or write a 90-second explanation for a business owner.

Evidence: Complete all three section checks and written exercises, the belt knowledge exam, and the reviewed practical assessment. Knowledge pass: 80%. Practical pass: 80%.

YELLOW BELT

L04 | Voltage current and circuit thinking

Voltage is electrical potential difference; current is charge flow; resistance opposes current. In a simple DC exercise $P = V \times I$ and $V = I \times R$.

L05 | How modules behave

Cells form modules; modules form arrays. Series connections add voltage; parallel paths add current in simplified circuit models.

L06 | AC service and compatibility

Buildings can have different service voltages and phase arrangements. Never infer electrical compatibility from roof size or a residential-looking exterior.

Apply it: Units and service compatibility. A fictional DC circuit operates at 400 V and 8 A for two hours at constant conditions.

Evidence: Complete all three section checks and written exercises, the belt knowledge exam, and the reviewed practical assessment. Knowledge pass: 80%. Practical pass: 80%.

COURSE SEQUENCE

Orange + Green belts

ORANGE BELT

L07 | Inverter architectures and MPPT

String inverters, module-level inverters and optimizers are different architectures. Maximum power point tracking adjusts operation to harvest available PV power.

L08 | Racking balance of system and warranties

A project includes mounting, electrical protection, disconnecting means, conductors, monitoring and supporting structures. These balance-of-system items can determine cost and feasibility.

L09 | Reading equipment documents

Use the exact product generation, country and configuration. Compare nominal energy, continuous power, operating conditions, compatibility, warranty and revision date.

Apply it: Cold-voltage screening and document lookup. Teaching-only module: Voc at 25°C = 50 V; linear coefficient = -0.25%/°C; assumed cell temperature = -5°C; 10 modules in series; hypothetical equipment absolute limit = 600 V.

Evidence: Complete all three section checks and written exercises, the belt knowledge exam, and the reviewed practical assessment. Knowledge pass: 80%. Practical pass: 80%.

GREEN BELT

L10 | Site qualification and roof planning

Collect address, ownership or lease authority, roof age, roof drawings, obstructions, shading, operational hours and planned changes. Roof replacement timing can change project economics.

L11 | Hazard recognition and stop-work judgment

Solar work can expose people to falls, electric shock, arc flash, heat and lifting hazards. Learn recognition and escalation before procedural tasks.

L12 | Permits interconnection and handoff

A permit review and a utility interconnection review serve different purposes. Record the authority having jurisdiction, utility, rate schedule, equipment approvals, inspection milestones and permission to operate.

Apply it: Safe site and approval plan. A leased coastal Florida building has an old roof and no service drawings.

Evidence: Complete all three section checks and written exercises, the belt knowledge exam, and the reviewed practical assessment. Knowledge pass: 85%. Practical pass: 80%.

COURSE SEQUENCE

Blue + Purple belts

BLUE BELT

L13 | Commercial bill anatomy

Read energy charges, demand charges and fixed charges independently. Ask for 12 months of bills, tariff details and interval data where available.

L14 | Load shape and demand reduction

A load profile shows power over time. Solar generation has its own profile.

L15 | Exports self-consumption and tariffs

Self-consumption means using generation at the site. Export means sending permitted surplus to the grid.

Apply it: Demand-aware commercial bill. Fictional tariff: 30,000 kWh at $0.14/kWh, 150 kW billed demand at $20/kW, $200 fixed.

Evidence: Complete all three section checks and written exercises, the belt knowledge exam, and the reviewed practical assessment. Knowledge pass: 85%. Practical pass: 80%.

PURPLE BELT

L16 | Powerwall family and backup architecture

Separate Powerwall 2, Powerwall+, Powerwall 3 and Powerwall 3 Expansion in training and proposals. Use current model-specific manuals.

L17 | Runtime reserve and power limits

Runtime calculations need usable available energy and the expected load. Nominal battery energy is not the amount available in every operating situation.

L18 | Tesla app operations and customer support

Teach customers how to interpret energy flows and discuss backup preferences using current Tesla instructions. Settings, feature names and availability can change by region and software.

Apply it: Powerwall consultation and source defense. Customer wants a 4 kW constant critical load for 8 hours.

Evidence: Complete all three section checks and written exercises, the belt knowledge exam, and the reviewed practical assessment. Knowledge pass: 85%. Practical pass: 80%.

Powerwall product knowledge includes current-source lookup, service compatibility, runtime assumptions and owner handoff. Installation and commissioning remain separate authorized activities.

COURSE SEQUENCE

Brown + Black belts

BROWN BELT

L19 | Production estimates and uncertainty

Estimate production from location, array capacity, orientation, tilt, shading and modeled losses. Record the model, inputs and assumptions.

L20 | Cash flow payback and incentive literacy

Separate price, financing, operating costs, bill savings, tax effects and replacement assumptions. Simple payback divides stated investment by stated annual net benefit under constant assumptions.

L21 | Proposal quality and objections

A useful proposal records goals, scope, equipment, production assumptions, tariff modeling, financial assumptions, exclusions, milestones and responsibilities. Compare alternatives on consistent assumptions.

Apply it: Cash flow and dated incentive analysis. Fictional investment $200,000; year-one gross bill savings $24,000; annual O&M $4,000; assume the resulting annual benefit stays constant for 10 years with no residual value.

Evidence: Complete all three section checks and written exercises, the belt knowledge exam, and the reviewed practical assessment. Knowledge pass: 90%. Practical pass: 90%.

BLACK BELT

L22 | Integrated commercial assessment

Combine discovery, site constraints, tariff analysis and equipment compatibility. Begin with evidence, label assumptions and separate screening conclusions from approved design.

L23 | Verification troubleshooting and technical judgment

Expertise includes knowing how to verify an answer. Identify product, region, software, symptoms and source revision.

L24 | Oral defense career pathway and renewal

Black Belt requires cumulative knowledge, a reviewed written capstone and an oral consultation. Hiring readiness also involves communication, reliability, role-specific qualifications and the company's actual recruitment process.

Apply it: Warehouse capstone and hiring interview. Fictional warehouse: 480 V three-phase, 25,000 kWh/month, measured peak 120 kW at 7 pm, ten-year-old roof, leased premises, customer requests whole-site Powerwall backup for 12 hours.

Evidence: Complete all three section checks and written exercises, the belt knowledge exam, and the reviewed practical assessment. Knowledge pass: 90%. Practical pass: 90%.

The Black Belt capstone includes a fictional three-phase warehouse case and an oral defense. Reviewers assess technical judgment, calculations, evidence, communication and escalation.

Assessment, credentials and next steps

How learning and assessment work

- Each section: read the illustrated lesson, study terms, work an example, complete three knowledge questions and submit the written exercise. Section knowledge requires at least 80%; with the initial three-item bank this requires all three correct. Written work requires at least 8/10.

- Belt exams: cover the current three lessons, with earlier material added at later levels. Critical safety errors cannot be offset by a high average score. Retakes follow targeted remediation and configured attempt limits.

- Practical assessments: reviewer-graded application tasks deepen from explanation to calculations, compatibility analysis and a documented consultation. Safety or integrity failures must be resolved before progression.

- Final defense: a 10-minute consultation and 10-minute source defense accompany the Black Belt capstone. Human approval is required; an automated quiz alone does not award Black Belt.

Credentials and employment pathway

Proposed company-issued awards are **Commercial Solar ROI - Solar Black Belt** and **Powerwall Product Knowledge Certificate**. The Powerwall award requires Purple-level completion, relevant safety and compatibility checks, a current-source assessment and reviewer approval.

These are internal learning credentials. They are not Tesla installer certification, NABCEP credentials, an electrical license or accreditation. The legal issuer, authorized signatory and technical reviewer must be confirmed before public issuance. Proposed renewal is every 12 months, with updates when important product or rule changes occur.

Members may separately opt in to a company hiring review. Completion supports consideration, not guaranteed employment. Role-specific requirements and any external qualifications remain part of recruitment.

Sources, accessibility and support

Lessons link to Tesla Energy Library and Support, the U.S. Department of Energy, OSHA, utility information, IRS guidance and NABCEP pathway information. Manufacturer specifications and applicable rules must be checked for the exact model, region and project date. Use the academy resource catalog for full links.

Study with text, original illustrations, vocabulary recall and optional device read-aloud. Request timing or presentation accommodations through the academy support channel once published. Employer support contacts and instructor/reviewer names are to be supplied before enrollment opens.

Optional three-day intensive

Day 1: White through Green. Day 2: Blue and Purple, including bill and Powerwall exercises. Day 3: Brown and Black review, capstone preparation and practice consultation. This is a study option, not a promise of certification in three days; reviewer scheduling, prerequisites and demonstrated competence still apply.