TVPPA Education & Training

TVPPA/UTS Power Line Design & Staking Certification
6-Stage Course Descriptions

Online Option

The Power Line Design & Staking series is offered online. The only exception to the online offering is Stage 6. That Stage is only offered in a classroom setting. Registrants are given about two weeks to complete each online course. Estimated total time investment required for course work = 10-14 hours.

Power Line Design & Staking, Stage 1 - 2.5 days

Pre-requisite: None. Hours: 14 CEUs: 1.4

Information covered Stage 1 provides foundational instruction for all career line designers. Attendees learn basic engineering of overhead services typically expected of beginning line design personnel. The course includes a comprehensive overview of: responsibility and liability issues; safety procedures and equipment; communication and easement acquisition skills; power system overview; mapping, drafting, and field engineering tools and equipment; work order flow; distribution system components and line equipment identification; NESC requirements (thorough overview relative to distribution design); overhead service and secondary lines; and sizing residential transformers. The course is taught at a line design technician level where all engineering calculations are streamlined with easy to read charts for gathering data. Written exam given on last day of class. Course handbook and certification program supplies are provided (including scientific calculator – Casio FX300MS Plus or similar model with trigonometric functions).

Additional course material requirements: *Bring to class - copy of the current (2017) NESC, not provided in this course*

Power Line Design & Staking, Stage 2 - 2.5 days

Pre-requisite: Power Line Design & Staking, Stage 1. Hours: 14 CEUs: 1.4

Stage 2 includes a more comprehensive look at design criteria related to overhead design. Among other things, it offers the line design technician opportunity to further advance knowledge of: power utility corporate structures and organizations; overhead equipment operation – protection, connection and quality; right-of-way acquisitions; government agency (DOT, FAA, etc.) and railroad permitting requirements; NESC requirements relative to overhead lines and construction; conductor blowout and grain bin design and analysis; line design concepts (ruling span, sag and tension, understanding sag charts); and single phase line design (pole-top pin insulator, angle and dead end guy loading). Written exam given on last day of class. Course handbook provided.

Additional course material requirements: *Bring to class - Scientific Calculator provided in Stage 1 (or a similar model with trigonometric functions), and a copy of the current (2017) NESC*

TVPPA Education & Training

Power Line Design & Staking, Stage 3 - 2.5 days

Pre-requisite: Power Line Design & Staking, Stage 1 & 2 Hours: 14 CEUs: 1.4

Stage 3 of the Power Line Design series places emphasis on joint use remedy and make ready, as well as underground design. Attendees will learn: NESC requirements relative to joint use facilities and underground construction; advanced mechanical line design (multi-phase); joint use of facilities considerations plus NESC requirements for compliance; field engineering make ready work; underground distribution components; underground sizing for transformer, secondary and service conductor, spacer cable/tree wire considerations; and latest technological advancements in line design (i.e., equipment and software). The certification test for this stage will be given on the last day. Course handbook provided.

Additional course material requirements: *Bring to class - Scientific Calculator provided in Stage 1 (or a similar model with trigonometric functions), and a copy of the current (2017) NESC*

Power Line Design & Staking, Stage 4 - 2.5 days

Pre-requisite: Power Line Design & Staking, Stage 1, 2 & 3 Hours: 14 CEUs: 1.4

Stage 4 includes a more comprehensive view of designing a line from beginning to end including analyzing crossings under existing transmission lines. Among many other things, this stage builds on previous levels and examines: NESC requirements relative to construction limits for design; line design limited by insulators, crossarms, bolts etc.; understanding and creating stringing charts for construction; and economics in distribution engineering. Written exam given on last day. Course handbook provided.

Additional course material requirements: *Bring to class - Scientific Calculator provided in Stage 1 (or a similar model with trigonometric functions), and a copy of the current (2017) NESC*

Power Line Design & Staking, Stage 5 – 2.5 days

Pre-requisite: Power Line Design & Staking, Stage 1, 2, 3 & 4 Hours: 14 CEUs: 1.4

Stage 5 of the Power Line Design series takes students beyond the basics of power line design and staking and focuses on reliability and efficiency in design. Factors that contribute to the aging power infrastructure are introduced and ways to analyze and correct or improve problems most cost effectively are discussed. Students learn mechanical loading options for multi-circuits, and are guided through the process of calculating loads on manufactured structures. The current NESC is reviewed and students learn when and how to apply Rule 250 C and D. Electric utility standards (public power, municipalities, RUS) are defined and students discuss procedure to keep their own utility compliant. The certification test for this stage will be given on the last day. Course handbook provided.

Additional course material requirements: *Bring to class - Scientific Calculator provided in Stage 1 (or a similar model with trigonometric functions), and a copy of the current (2017) NESC*

TVPPA Education & Training

Power Line Design & Staking, Stage 6 – 2.5 days

Pre-requisite: Power Line Design & Staking, Stages 1, 2, 3, 4 & 5 Hours: 14 CEUs: 1.4

In the final Stage 6 of the Power Line Design series, focus remains on system reliability. Students learn calculations for commercial load sizing (multi-phase transformer sizing, reading commercial load charts and plans, primary wire sizing considerations). Purpose of and procedure for joint use inspection is covered along with RUS standards and bulletins and how these pertain to utilities. Students learn about circuit protection, including proper equipment selection and placement. The course wraps up with an evaluation of system design and limitations in light of extreme conditions (system hardening) and storm preparation and restoration, including discussion of FEMA policy and requirements. Written exam given on last day of class. Course handbook provided.

Additional course material requirements: *Bring to class - Scientific Calculator provided in Stage 1 (or a similar model with trigonometric functions), and a copy of the current (2017) NESC*