2026 Power PE Exam Class Syllabus

Class #1 - How to Pass the PE Exam

Join our introductory class on how to use the live webinar software and maximize your experience. We'll cover the live class schedule, key areas to focus on leading up to the PE exam, effective study techniques, and exam strategies tailored to help you achieve the highest score. You'll also gain insights into what successful engineers are doing differently to pass the PE exam. The session will wrap up with a live Q&A to address your questions.

***Required Pre-work:** Complete the following online on-demand coursework prior to class:

1. Read the official *NCEES*® Examinee Guide.
2. Download/print the official *NCEES*® Exam Specifications.
3. Apply for and schedule your PE Exam if you have not already done so.
4. Verify the most up to date Exam Specifications, Reference Handbook, and code books: 📌 NCEES Power PE Exam Specifications, Codebooks, and Reference Handbook (Always Up-To-Date)

***Recommended Pre-work:** Additional recommendations that are not required but useful:

- Article - What Do Successful Engineers that Pass the Electrical PE Exam Have in Common? (click here)
- "How to Pass the CBT PE Exam" YouTube Interviews with Former Students
- Article - Recommended References for the Electrical Power PE Exam (click here)

NEC® Class - National Electrical Code® for the PE Exam

**Note: Date for this code class varies each semester. Refer to the class schedule for the exact date. In on-demand semesters, it follows Class #1 How to Pass the PE Exam.*

Our National Electrical Code® (NEC) class is designed to make the Code more approachable and directly applicable to PE exam problems. In just three hours, we'll cover how to navigate the NEC efficiently, identify the right chapters and articles, and apply them to real exam-style questions with live examples. You'll gain practical, hands-on skills to tackle complex scenarios with confidence and leave seeing the Code as a powerful tool rather than an obstacle.

***Required Pre-work:** Complete the following online on-demand coursework prior to class:

1. Ch 3.1 - 3.4 Electrical Safety: all lessons and quizzes (click here)

Class #2 - Circuit Analysis

Single Phase Circuits, Delta vs Wye, Three Phase Systems, One Line Diagrams, Balanced vs Unbalanced Systems, Positive ABC vs Negative BCA Sequence, Phasor Diagrams, Leading vs Lagging, When to use √3, DC Circuits, Two Method Watt-meter, DC Circuits, National Electrical Code® Conductor Sizing Practice Problems.

***Required Pre-work:** Complete the following online on-demand coursework prior to class:

1. Article - Leading and Lagging Cheat Sheet! Printable Reference (click here)
2. i. Introduction - Complex Numbers: lessons #1 through #5 and quiz (click here)
3. Power Fundamentals Boot Camp (click here)
4. Circuit Analysis Boot Camp (click here)
5. Ch 4.4 - Phasor Diagrams: lesson (click here)
6. Ch 4.1 - Three Phase Circuits: lesson and quiz (click here)
7. Ch 4.6 - Direct Current Circuits: lesson and quiz (click here)
8. Ch 1.1 - Instrument Transformers and Metering: lesson and quiz (click here)

***Recommended Pre-work:** Additional recommendations that are not required but useful:

- Article - Avoid These Three Phase Power Formula Mistakes! (click here)

Class #3 - Transformers

Transformer Basics and Theory, Transformer Formulas and Ratios, Magnetic Circuits (Flux, MMF, Reluctance), Single Phase Transformers, Three Phase Transformers, Auto-transformers, Transformer Connections, Transformer Losses, Transformer Tests, System Grounding Applications, Reactor Quality Factor, Parallel Transformers, National Electrical Code® Transformer Practice Problems.

***Required Pre-work:** Complete the following online on-demand coursework prior to class:

1. Ch 7.1 - Transformers: lesson and quiz (click here)
2. Ch 7.4 - Testing: lesson and quiz (click here)
3. Ch 7.5 - Reactors: lesson and quiz (click here)
4. Ch 8.6 - Transformer Connections: lesson and quiz (click here)
5. Ch 2.6 - Grounding (click here)
6. Ch 8.7 - Power Flow: (Sections #8 - #18 Parallel Load Sharing Transformers + Quiz)

***Recommended Pre-work:** Additional recommendations that are not required but useful:

- Article - Open Delta Transformer Connection (click here)

Class #4 - Rotating Machines

Induction and Synchronous Machines, Induction Motor Starting, Induction Motor Power Flow, Induction Motor Equivalent Circuit, No Load and Locked Rotor Test, Torque vs Speed, Speed Control, Torque Formulas, Synchronous Machine Single-phase Equivalent Circuits, Synchronous Machine Phasor Diagrams and Excitation, Machine Voltage Regulation, Maximum Power, Governor Control and Speed Droop, Cylindrical vs Salient Pole Rotors, Synchronizing Power, Open and Short Circuit Test, The Power Angle Curve, Stability, National Electrical Code® Rotating Machines Practice Problems.

***Required Pre-work:** Complete the following online on-demand coursework prior to class:

1. Ch 6.1 - Electrical Machine Theory: lesson and *ALL THREE* quizzes: Synchronous Machines, Induction Machines, and Speed & Torque (click here)
2. Ch 6.2 - Equivalent Circuits and Characteristics: lesson and quiz (click here)
3. Ch 6.3 - Generator/Motor Applications: lesson and quiz (click here)
4. Ch 6.4 - Motor Starting: lesson and quiz (click here)

Class #5 - Devices & Power Electronics

Relays, Switches, and PLC's, Batteries and Power Supplies, RMS, Peak, and Instantaneous Power, Calculating Average and RMS, Instantaneous Phase Shifts, DC Offset, DC Value, Ripple (Both Formulas), Diodes and Thyristors (SCR's), Half Wave Rectifiers, Full Wave Rectifiers, Three Phase Rectifiers, Smoothing Capacitors, Variable Frequency Drives (VFD's), Insulated Gate Bipolar Transistors (IGBT), Pulse Width Modulation (PWM), Volts per Hertz Ratio, Digital Logic, Boolean Algebra, National Electrical Code® Power Electronics Practice Problems.

***Required Pre-work:** Complete the following online on-demand coursework prior to class:

1. Ch 7.3 - Electrical Energy Storage - Batteries: lesson and quiz (click here)
2. Ch 5.1 - Power Electronics: lesson and quiz (click here)
3. Ch 5.2 - Variable Frequency Drives: lesson and quiz (click here)
4. Ch 5.3 - Relays, Switches, Boolean, and Ladder Logic: lesson and quiz (click here)

***Recommended Pre-work:** Additional recommendations that are not required but useful:

- Article - Power Supplies Qualitative Practice Problem (click here)

Class #6 - Power Factor Correction & Power Flow

Power Triangle Relationships, Single Phase vs Three Phase, Power Factor Review, Power Factor Diagrams, How do we Improve Power Factor? What About Multiple Loads? What about Delta and Wye Loads? Determining Required Capacitance, Determining Number of Capacitors, Trigonometry Relationships, Geometry Relationships, Three Phase System Power Factor, Direction of Current, National Electrical Code® Capacitor Practice Problems.

***Required Pre-work:** Complete the following online on-demand coursework prior to class:

1. Ch 7.2 - Capacitors: lesson and quiz (click here)
2. Ch 8.3 - Power Factor Correction: lesson and quiz (click here)
3. Ch 8.7 - Power Flow: (Sections #1 - #7 Power Flow Between Two Buses and Admittance Y Bus Videos Only)

***Recommended Pre-work:** Additional recommendations that are not required but useful:

- Article - Leading and Lagging Cheat Sheet! Printable Reference (click here)

Class #7 - Transmission Lines, Voltage Drop, & Voltage Regulation

Single Phase Voltage Drop, Three Phase Voltage Drop, √3 Multiplier, Calculating Voltage Drop, Conductor Impedance, NEC® Ch 9. Table 9, Calculating Effective Impedance, Calculating Voltage Regulation, Transmission Line Basics, Calculating GMD, Calculating GMR, Line Inductance and Capacitance, Solving for Ohms, Transmission Line Series Compensation, K Factor, National Electrical Code® Voltage Drop Practice Problems.

***Required Pre-work:** Complete the following online on-demand coursework prior to class:

1. Ch 8.1 - Voltage Drop: lesson and quiz (click here)
2. Ch 8.2 - Voltage Regulation: lesson and quiz (click here)
3. Ch 8.9 - Transmission Line Models: lesson and quiz (click here)

***Recommended Pre-work:** Additional recommendations that are not required but useful:

- Article - Confusing Impedances: What's the difference? (click here)

Class #8 - Per Unit, Fault Current Analysis, & Symmetrical Components

Per Unit Basics, How to Select Base Values, Voltage Base With More Than One Transformer, How to Calculate Z Base and I Base, Calculating Vpu and Ipu, Fault Current Analysis, Series Impedance, Fault Current Analysis MVA Method, Fault Current Analysis Per Unit Method, Symmetrical Components Basics, Symmetrical Components Fault Circuits, Solving for Three Phase Faults, Double Line Faults, Double Line to Ground Faults, Single Line to Ground Faults, National Electrical Code® Practice Problems.

***Required Pre-work:** Complete the following online on-demand coursework prior to class:

1. Ch 4.3 - Per Unit System: lesson (click here)
2. Article - Base Changing Percent Impedance and Per Unit Impedance
3. Article - Per Unit Example: How To, Tips, Tricks, and What to Watch Out for (click here)
4. Ch 8.5 - Fault Current Analysis: lesson and quiz (click here)
5. Ch 4.2 - Symmetrical Components: lesson and quiz (click here)
6. Article - Symmetrical Components Single Line to Ground Fault Example (click here)

***Recommended Pre-work:** Additional recommends that are not required but useful:

- Article - Confusing Impedances: What's the difference? (click here)
- Article - Calculating Base Impedance: When Do We Use Single Phase or Three Phase Values? (click here)

Class #9 - Protection

Overcurrent, Overcurrent Protection, Fuses, Breakers, Re-closers, Sectionalizers, Instrument Transformers, Multi-ratio CT's, CT Burden, PT's, Device Operation and Control Wiring, Pick Up Settings and Multiples of Pick Up, Time Delay Curves and Settings, Differential Protection, Device Trip Characteristics, TCC Graphs and Coordination, Zone Protection, Backup Protection, National Electrical Code® Protection Practice Problems.

***Required Pre-work:** Complete the following online on-demand coursework prior to class:

1. Ch 9.1 - Overcurrent Protection: lesson (click here)
2. Ch 9.2 - Protective Relaying: lesson and quiz (click here)
3. Ch 9.3 - Protective Devices: lesson and quiz (click here)
4. Ch 9.4 - Coordination: lesson and quiz (click here)

Class #10 - General Applications & Miscellaneous

Boolean Logic and De Morgan's Theorem, NAND and NOR Gates, Lightning and Surge Protection, Lightning Strike Frequency and Tolerable Frequency, Lightning Protection Zones, Harmonics and THD, Voltage Unbalance, Demand and Load Calculations, Energy Management and Transformer Losses, Grounding Rods and Ground Resistance Testing, Soil Resistivity, Lighting and Illumination Design, Coefficient of Utilization, Nadir Lighting, Room Cavity Ratios, Minimum Maintained Illumination, Alternative Power Generation (PV and Wind), Ultracapacitors and Batteries.

***Required Pre-work:** Complete the following online on-demand coursework prior to class:

1. Ch 2.3 - Illumination/lighting: lesson and quiz (click here)
2. Ch 2.4 - Demand Calculations: lesson and quiz (click here)
3. Ch 2.5 - Energy Management: lesson and quiz (click here)
4. Ch 1.2 - Insulation Testing: lesson and quiz (click here)

Class #11 - End of Class Test

This will be a special class consisting of live practice problem-solving. I will be challenging you with non-stop practice problems from every subject focusing on difficult and tricky questions to expose any last-minute weakness that you need to work on before the exam.

This is not a lecture and student participation will be highly pushed for.
Come prepared, bring your calculator, and be ready to be thoroughly tested!

***Required:** Complete the Electrical PE Review End of Class Test prior to Class #11. You will be sent the End of Class Test after the previous Live Class #10 and will have approximately one week to complete it prior to Live Class #11.

Useful Links for the New CBT Format of the PE Exam:

NFPA® Link - digital access to all exam code books except for the ANSI C2 National Electrical Safety Code (NESC). Paid Subscription (reccommended):
https://www.nfpa.org/nfpa-link

NFPA® Free Access, digital access to the same code books. Free but not as user friendly as NFPA® Link:
https://www.nfpa.org/for-professionals/codes-and-standards/list-of-codes-and-standards/free-access

The Official NCEES® Electrical Power PE Exam Specifications:
https://ncees.org/pe-electrical-and-computer-power-exam/

NCEES® Reference Handbook Download:
https://account.ncees.org/reference-handbooks/

How to Search the Onscreen NCEES® Reference Handbook:
https://youtu.be/cvob3-PUAPc

NCEES® YouTube Playlist “Explore the Computer-Based Exam Experience”:
https://youtube.com/playlist?list=PLiZ0hjHNi9jzR8RW69ndkjIgH8bzj0ew-

Pearson VUE Reusable Booklet Demo:
https://www.youtube.com/watch?v=3-n1Zzh0NnM

The Official NCEES® Examinee Guide:
https://ncees.org/wp-content/uploads/ExamineeGuide_November-2020.pdf

The Official NCEES® Calculator Policy:
https://ncees.org/exams/calculator/

Pearson VUE CBT Test Software Demo:
https://wsr.pearsonvue.com/demo/

Electrical PE Review’s Recommended References:
http://www.electricalpereview.com/recommended-references-resources-electrical-power-pe-exam

New YouTube show by Zach Stone, P.E., weekly interviews with prior students that passed the PE exam called “How to Pass the CBT PE Exam”:
https://youtube.com/playlist?list=PL8UEnCgTyXQuJw1NWMQ5N2KgL1zysB9HA