

Power PE Exam Class Syllabus (*On-Demand Portion 178 Hours*)

Section 1 - Circuits Analysis

Classwork Lecture (Videos)			Hours
1	Video 1 - Direct Current Refresher (30 minutes)		0.50
2	Video 2 - AC vs DC (19 minutes)		0.32
3	Video 3 - Different Ways to Represent Alternating Current (30 minutes)		0.50
4	Video 4 - Leading vs Lagging Loads (10 minutes)		0.25
5	Video 5 - Power Factor Triangle (30 minutes)		0.50
6	Video 6 - Single Phase vs Three Phase (18 minutes)		0.30
7	Video 7 - Three Phase Wye Arrangement (17 minutes)		0.28
8	Video 8 - Three Phase Delta Arrangement (14 minutes)		0.23
9	Video 9 - Three Phase, Three Pole (24 minutes)		0.40
10	Video 10 - Single Phase, 1 Pole (13 minutes)		0.22
11	Video 11 - Single Phase, 2 Pole (16 minutes)		0.27
12	Video 12 - Other Arrangements (22 minutes)		0.37
13	Video 13 - Symmetrical Components (14 minutes)		0.23
14	Video 14 - Per Unit System (37 minutes)		0.62
Classwork Practice Problem (Videos)			Hours
1	Video 15 - Practice Problem 1 - Wye Load with a Missing Phase (7 minutes)		0.12
2	Video 16 - Practice Problem 2 - Per Unit Analysis (12 minutes)		0.20
3	Video 17 - Practice Problem 3 - Delta Load - Method 1 KVL (7 minutes)		0.12
4	Video 18 - Practice Problem 3 - Delta Load - Method 2 KVL (8 minutes)		0.13
5	Video 19 - Practice Problem 4 - Single Phase Load with 2 Hot Wires (4 minutes)		0.07
6	Video 20 - Practice Problem 5 - Solving for Sequence Components (13 minutes)		0.22
7	Video 21 - Practice Problem 6 - Using your Power Factor Triangle (6 minutes)		0.10
8	Video 22 - Practice Problem 7 - Power Factor Triangle with 3 Phase Leading Load (15 minutes)		0.25
9	Video 23 - Practice Problem 8 - Three Phase Load Power Calculations (13 minutes)		0.22
10	Video 24 - Practice Problem 9 - Transformer Impedance Calculations (7 minutes)		0.12
Homework (Reading and Practice Problems)			Hours
1	Read circuit analysis chapter	Book: Technical Study Guide	4.00
2	Complete all circuits practice problems	Book: Technical Study Guide	2.00
Weekly Exam (Following completion of classwork and homework)			Hours
1	1st Circuits Analysis Practice Exam (9 Problems: Difficulty Level - Easy to Medium)	<i>Link to be provided upon sign-up</i>	2.00
2	2nd Circuits Analysis Practice Exam (10 Problems: Difficulty Level - Medium to Hard)	<i>Link to be provided upon sign-up</i>	2.00
3	Check practice exam solutions	Solutions released after you submit your answers.	2.00
Total:			18.52

Section 2 - Power Electronic Devices

Classwork Lecture (Videos)			Hours
1	Video 1 - Battery Characteristics & Ratings (22 minutes)		0.37
2	Video 2 - Battery Discharging (9 minutes)		0.15
3	Video 3 - Battery Charging (6 minutes)		0.10
4	Video 4 - Single Phase, Half Wave Rectifier (13 minutes)		0.22
5	Video 5 - Single Phase, Full Wave Rectifier (9 minutes)		0.15
6	Video 6 - Three Phase, Half Wave Rectifier (16 minutes)		0.27
7	Video 7 - Three Phase, Full Wave Rectifier (9 minutes)		0.15
8	Video 8 - Variable Speed Drives (13 minutes)		0.22
9	Video 9 - Ladder Logic and Ladder Diagrams (28 minutes)		0.47
Classwork Practice Problem (Videos)			Hours
1	Video 10 - Practice Problem 1 - Single Phase, Half Wave Rectifier, Reverse Voltage Rating (6 minutes)		0.10
2	Video 11 - Practice Problem 2 - Battery Charging with Efficiency (2 minutes)		0.03
3	Video 12 - Practice Problem 3 - Single Phase, Half Wave Rectifier with Delay Angle (5 minutes)		0.08
4	Video 13 - Practice Problem 4 - 3 Three Phase, Full Wave Rectifier with Lost Phase (7 minutes)		0.12
5	Video 14 - Practice Problem 5 - Solve for Rectifier RMS from Full Exam Problem 10 (8 minutes)		0.13
6	Video 15 - Practice Problem 6 - Ladder Logic - Hand Mode (6 minutes)		0.10
7	Video 16 - Practice Problem 7 - Ladder Logic - Level Switch Low Fails (6 minutes)		0.10
8	Video 17 - Practice Problem 8 - Ladder Logic - Level Switch High Fails (3 minutes)		0.05
Homework (Reading and Practice Problems)			Hours
1	Read Devices & Power Electronic Circuits chapter	Book: Technical Study Guide	4.00
2	Complete all Devices & Power Electronic Circuits practice problems	Book: Technical Study Guide	2.00
3	Check solutions	Do not look at solutions until you completed the problems.	1.00
Weekly Exams (Following completion of classwork and homework)			Hours
1	1st Devices & Power Electronic Circuits Practice Exam (7 Problems: Difficulty Level - Easy to Medium)	<i>Link to be provided upon sign-up</i>	2.00
2	2nd Devices & Power Electronic Circuits Practice Exam (10 Problems: Difficulty Level - Medium to Hard)	<i>Link to be provided upon sign-up</i>	2.00
3	Check practice exam solutions	Solutions released after you submit your answers.	2.00
Total:			15.80

Section 3 - Rotating Machines

Classwork (Videos)			Hours
1	Video 1 - Synchronous Generators (18 minutes)		0.30
2	Video 2 - Synchronous Generator - Equivalent Circuit (23 minutes)		0.38
3	Video 3 - Synchronous Motors (10 minutes)		0.17
4	Video 4 - Synchronous Motor - Equivalent Circuit (13 minutes)		0.22
5	Video 5 - Induction Motor (17 minutes)		0.28
6	Video 6 - Induction Motor - Equivalent Circuit (25 minutes)		0.42
7	Video 7 - Induction Motor - Speed Torque Relationships (20 minutes)		0.33
8	Video 8 - Induction Motor at Various Loadings (14 minutes)		0.23
9	Video 9 - Induction Motor Starting (18 minutes)		0.30
10	Video 10 - Variable Frequency Drive as Motor Starter (11 minutes)		0.18
11	Video 11 - Rotating Machines Miscellaneous Terms (5 minutes)		0.08
Classwork Practice Problem (Videos)			Hours
1	Video 12 - Practice Problem 1 - Induction Motor Slip, No Load Speed, Full Load Speed (7 minutes)		0.12
2	Video 13 - Practice Problem 2 - Induction Motor Speed Regulation (3 minutes)		0.05
3	Video 14 - Practice Problem 3 - Induction Motor Changes as a Function of Load (7 minutes)		0.12
4	Video 15 - Practice Problem 4 - Induction Motor Torque (7 minutes)		0.12
5	Video 16 - Practice Problem 5 - Synchronous Generator Voltage Regulation (6 minutes)		0.10
6	Video 17 - Practice Problem 6 - Synchronous Generator (6 minutes)		0.10
7	Video 18 - Practice Problem 7 - Synchronous Motor (7 minutes)		0.12
Homework (Reading and Practice Problems)			Hours
1	Read circuit analysis chapter	Book: Technical Study Guide	4.00
2	Complete all circuits practice problems	Book: Technical Study Guide	2.00
3	Check solutions	Do not look at solutions until you completed the problems.	2.00
Weekly Exam (Following completion of classwork and homework)			Hours
1	1st Rotating Machines Practice Exam (10 Problems: Difficulty Level - Easy to Medium)	Link to be provided upon sign-up	2.00
	2nd Rotating Machines Practice Exam (10 Problems: Difficulty Level - Medium to Hard)	Link to be provided upon sign-up	2.00
2	Check practice exam solutions	Solutions released after you submit your answers.	
Total:			15.62

Section 4 - Electric Power Devices

Classwork Individual Topic Videos			Hours
1	Video 1 - Transformers Intro and Ideal Single Phase Transformer Equations (21 minutes)		0.35
2	Video 2 - Three Phase Transformers (24 minutes)		0.40
3	Video 2A - Three Single Phase Transformers Arranged as Wye-Wye (4 minutes)		0.07
4	Video 3 - Transformer Equivalent Circuit (14 minutes)		0.23
5	Video 4A - Transformer Testing (30 minutes)		0.50
6	Video 4B - Transformer Testing Practice Problems (9 minutes)		0.15
7	Video 5 - Transformer Cooling Methods (16 minutes)		0.27
8	Video 6 - Buck and Boost Autotransformers (8 minutes)		0.13
9	Video 7 - Autotransformers (17 minutes)		0.28
10	Video 8 - Capacitors (18 minutes)		0.30
11	Video 9 - Reactors (6 minutes)		0.10
Classwork Individual Practice Problem Videos			Hours
1	Video 10 - Practice Problem 1 - Reconfigured Autotransformer (6 minutes)		0.10
2	Video 11 - Practice Problem 2 - Construction a 3-PH Transformer from 1-PH Transformers (6 minutes)		0.10
3	Video 12 - Practice Problem 3 - Parallel Transformers (6 minutes)		0.10
4	Video 13 - Practice Problem 4 - Coming Soon		0.00
5	Video 14 - Practice Problem 5 - Transformer Percent Impedance and Short Circuit Testing (10 minutes)		0.17
6	Video 15 - Practice Problem 6 - Transformer Losses, Efficiency and % Impedance (8 minutes)		0.13
7	Video 16 - Practice Problem 7 - Total Losses at Transformer (4 minutes)		0.07
8	Video 17 - Practice Problem 8 - Capacitor Ratings (3 minutes)		0.05
Homework (Reading and Practice Problems)			Hours
1	Read Electric Power Devices chapter	Book: Technical Study Guide	4.00
2	Complete all Electric Power Devices practice problems	Book: Technical Study Guide	2.00
3	Check solutions	Do not look at solutions until you completed the problems.	2.00
Weekly Exam (Following completion of classwork and homework)			Hours
1	1st Electric Power Devices Practice Exam (6 Problems: Difficulty Level - Easy to Medium)	<i>Link to be provided upon sign-up</i>	2.00
2	2nd Electric Power Devices Practice Exam (10 Problems: Difficulty Level - Medium to Hard)	<i>Link to be provided upon sign-up</i>	2.00
3	Check practice exam solutions	Solutions released after you submit your answers.	2.00
Total:			17.50

Section 6 - Protection

Classwork (Videos)			Hours
1	Video 1 - Overcurrent Protection Scheme (12 minutes)		0.20
2	Video 2 - Overcurrent Protection (23 minutes)		0.38
3	Video 3 - MVA Method to Find Ampere Interrupting Capacity (23 minutes)		0.38
4	Video 4 - Per Unit Method to Find Ampere Interrupting Capacity (17 minutes)		0.28
5	Video 5 - Distance Relays (15 minutes)		0.25
6	Video 6 - Differential Relays (24 minutes)		0.40
7	Video 7 - Directional Relays (2 minutes)		0.03
8	Video 8 - Other Relays (21 minutes)		0.35
9	Video 9 - Protective Device - Fuses, Breakers and Reclosers (20 minutes)		0.33
10	Video 10 - Protective Devices - GFCIs and AFCIs (10 minutes)		0.17
11	Video 11 - Coordination (24 minutes)		0.40
Classwork Practice Problem (Videos)			Hours
1	Video 12 - Practice Problem 1 - Time Dial Settings and TCC Graph (4 minutes)		0.07
2	Video 13 - Practice Problem 2 - MVA Method AIC Transformer and Transmission Line (4 minutes)		0.07
3	Video 14 - Practice Problem 3 - Ampere Interrupting Capacity with Utility Fault Duty (8 minutes)		0.13
4	Video 15 - Practice Problem 4 - Contributing Short Circuit MVA and MVA Method (5 minutes)		0.08
5	Video 16 - Practice Problem 5 - Overload Protection Rating with NEC (13 minutes)		0.22
6	Video 17 - Practice Problem 6 - Short Circuit Ground Fault Protection Rating with NEC (8 minutes)		0.13
7	Video 18 - Practice Problem 7 - Overload Protection after Capacitor Installation (8 minutes)		0.13
8	Video 19 - Practice Problem 8 - Distance Relay (11 minutes)		0.18
9	Video 20 - Practice Problem 9 - Generator Protection Directional and Speed Relays (5 minutes)		0.08
10	Video 21 - Practice Problem 10 - TCC Graph - Primary & Backup Breakers (8 minutes)		0.13
Homework (Reading and Practice Problems)			Hours
1	Read Protection chapter	Book: Technical Study Guide	4.00
2	Complete all Protection practice problems	Book: Technical Study Guide	2.00
3	Check solutions	Do not look at solutions until you completed the problems.	2.00
Weekly Exam (Following completion of classwork and homework)			Hours
1	1st Protection Practice Exam (8 Problems: Difficulty Level - Easy to Medium)	Link to be provided upon sign-up	2.00
2	2nd Protection Practice Exam (10 Problems: Difficulty Level - Medium to Hard)	Link to be provided upon sign-up	2.00
3	Check practice exam solutions	Solutions released after you submit your answers.	2.00
Total:			18.42

Section 7 - Measurement/Instrumentation

Classwork (Videos)			Hours
1	Video 1 - Instrument Transformers - Current Transformers (40 minutes)		0.67
2	Video 2 - Insulation Testing (24 minutes)		0.40
3	Video 3 - Ground Resistance Testing (28 minutes)		0.47
Classwork Practice Problem (Videos)			Hours
1	Video 4 - Practice Problem 1 - Current Transformer Saturation (5 minutes)		0.08
2	Video 5 - Practice Problem 2 - Current Transformer Relay Accuracy (3 minutes)		0.05
3	Video 6 - Practice Problem 3 - Insulation Testing Terms (5 minutes)		0.08
4	Video 7 - Practice Problem 4 - Ground Resistance Testing (5 minutes)		0.08
Homework (Reading and Practice Problems)			Hours
1	Read Measurement & Instrumentation chapter	Book: Technical Study Guide	2.00
2	Complete all Measurement & Instrumentation practice problems	Book: Technical Study Guide	1.00
3	Check solutions	Do not look at solutions until you completed the problems.	1.00
Weekly Exam (Following completion of classwork and homework)			Hours
1	1st Measurement & Instrumentation Practice Exam (6 Problems: Difficulty Level - Easy to Medium)	Link to be provided upon sign-up	2.00
2	2nd Measurement & Instrumentation Practice Exam (3 Problems: Difficulty Level - Medium to Hard)	Link to be provided upon sign-up	1.00
3	Check practice exam solutions	Solutions released after you submit your answers.	1.00
Total:			9.83

Section 8 - Applications

Classwork Individual Topic Videos			Hours
1	Video 1 - Lightning and Surge Protection (18 minutes)		0.30
2	Video 2 - Reliability - Bus Arrangements and Calculations (24 Minutes)		0.40
3	Video 3 - Illumination Engineering - Introduction and Zonal Cavity Method (20 minutes)		0.33
4	Video 4 - Illumination Engineering - Point to Point Method (12 minutes)		0.20
5	Video 5 - Demand Calculations (21 minutes)		0.35
6	Video 6 - Grounding (24 minutes)		0.40
7	Video 7 - Engineering Economics (13 minutes)		0.22
Classwork Individual Practice Problem Videos			Hours
1	Video 8 - Practice Problem 1 - Reliability (3 minutes)		0.05
2	Video 9 - Practice Problem 2 - Demand Calculations (7 minutes)		0.12
3	Video 10 - Practice Problem 3 - Illumination Engineering Point to Point Calculations (6 minutes)		0.10
4	Video 11 - Practice Problem 4 - UPS, ATS and Generator Reliability (6 minutes)		0.10
5	Video 12 - Practice Problem 5 - Grounding Systems (7 minutes)		0.12
6	Video 13 - Practice Problem 6 - Energy Management and Engineering Economics (6 minutes)		0.10
7	Video 14 - Practice Problem 7 - Lightning Protection (5 minutes)		0.08
8	Video 15 - Practice Problem 8 - Illumination Engineering with Two Lights (4 minutes)		0.07
Homework (Reading and Practice Problems)			Hours
1	Read Applications chapter	Hard Copy Book: Technical Study Guide	3.00
2	Complete all Applications practice problems	Hard Copy Book: Technical Study Guide	2.00
3	Check solutions	Do not look at solutions until you completed the problems.	2.00
Weekly Exam (Following completion of classwork and homework)			Hours
1	1st Applications Practice Exam [Online] (8 Problems: Difficulty Level - Easy to Medium)	Link to be provided upon sign-up	2.00
2	2nd Applications Practice Exam [Online] (7 Problems: Difficulty Level - Medium to Hard)	Link to be provided upon sign-up	2.00
3	Check practice exam solutions	Solutions released after you submit your answers.	2.00
Total:			15.93

Section 9 - Codes and Standards

Classwork (Videos)			Hours
1	Video 1 - NEC - Chapter 1 General - Overview and Key Sections (13 minutes)		0.22
2	Video 2 - NEC - Chapter 2 Wiring & Protection - Overview and Key Sections (30 minutes)		0.50
3	Video 3A - NEC - Chapter 3A Wiring Methods & Materials - Overview and Key Sections (16 minutes)		0.27
4	Video 3B - NEC - Chapter 3B Wiring Methods & Materials - Conductor Sizing (18 minutes)		0.30
5	Video 4 - NEC - Chapter 4 Equipment for General Use - Overview and Key Sections (24 minutes)		0.40
6	Video 5 - NEC - Chapter 5 Special Occupancies - Overview and Key Sections (18 minutes)		0.30
7	Video 6 - NEC - Chapter 6 Special Equipment - Overview and Key Sections (12 minutes)		0.20
8	Video 7 - NEC - Chapter 7 Special Conditions - Overview and Key Sections (5 minutes)		0.08
9	Video 8 - NEC - Chapter 8 Communication Systems - Overview and Key Sections (2 minutes)		0.03
10	Video 9 - NEC - Chapter 9 Tables - Overview and Key Sections (9 minutes)		0.15
11	Video 10 - NESC - Overview and Key Sections (23 minutes)		0.38
12	Video 11 - NFPA 70E - Overview and Key Sections (21 minutes)		0.35
13	Video 12 - NFPA 497 - Overview and Key Sections (10 minutes)		0.17
14	Video 13 - NFPA 499 - Overview and Key Sections (14 minutes)		0.23
15	Video 14 - NFPA 30B - Overview and Key Sections (11 minutes)		0.18
Classwork Practice Problem (Videos)			Hours
1	Video 15 - Practice Problem 1 - NEC Junction Box Sizing (13 minutes)		0.22
2	Video 16 - Practice Problem 2 - NEC Conduit Sizing (8 minutes)		0.13
3	Video 17 - Practice Problem 3 - NEC Ground Electrode Conductor Sizing (6 minutes)		0.10
4	Video 18 - Practice Problem 4A - Motor Overload Device Sizing (10 minutes)		0.17
5	Video 19 - Practice Problem 4B - NEC Motor Short Circuit Ground Fault Protection Sizing (9 minutes)		0.15
6	Video 20 - Practice Problem 4C - NEC Motor Conductor Sizing (9 minutes)		0.15
7	Video 21 - Practice Problem 4D - NEC Motor Ground Conductor Sizing (7 minutes)		0.12
8	Video 22 - Practice Problem 4E - NEC Motor Conduit Conductor Sizing (6 minutes)		0.10
9	Video 23 - Practice Problem 5 - NEC System Grounding (7 minutes)		0.12
10	Video 24 - Practice Problem 6 - NEC Sizing Conductors (6 minutes)		0.10
11	Video 25 - Practice Problem 7 - NEC Three Phase Load Voltage Drop (9 minutes)		0.15
12	Video 26 - Practice Problem 8 - NEC Single Phase Load Voltage Drop (5 minutes)		0.08
13	Video 27 - Practice Problem 9 - NFPA 70E Electrical Hazards (6 minutes)		0.10
14	Video 28 - Practice Problem 10 - NEC A/C Conductor and Overcurrent Protection Sizing (10 minutes)		0.17
Homework (Reading and Practice Problems)			Hours
1	Read codes and standards chapter	Book: Technical Study Guide	2.00
2	Complete all codes and standards practice problems	Book: Technical Study Guide	2.00
3	Check solutions	Do not look at solutions until you completed the problems.	2.00
Weekly Exam (Following completion of classwork and homework)			Hours
1	1st Codes & Standards Practice Exam (7 Problems: Difficulty Level - Easy to Medium)	Link to be provided upon sign-up	2.00
2	2nd Codes & Standards Practice Exam (10 Problems: Difficulty Level - Medium to Hard)	Link to be provided upon sign-up	2.00
3	3rd Codes & Standards Practice Exam (10 Problems: NESC Focus Difficulty Level - Easy to Hard)	Link to be provided upon sign-up	2.00
4	4th Codes & Standards Practice Exam (10 Problems: Difficulty Level - Easy to Hard)	Link to be provided upon sign-up	2.00
5	5th Codes & Standards Practice Exam (10 Problems: Difficulty Level - Easy to Hard)	Link to be provided upon sign-up	2.00
6	6th Codes & Standards Practice Exam (10 Problems: Difficulty Level - Easy to Hard)	Link to be provided upon sign-up	2.00

7	7th Codes & Standards Practice Exam (14 Problems: Difficulty Level - Easy to Hard)	<i>Link to be provided upon sign-up</i>	3.00
8	Check practice exam solutions	Solutions released after you submit your answers.	6.00
		Total:	32.62

Section 10 - Review	Complete Final Power PE Exam			Hours
	1	Complete Part 1 of Final Power PE Exam (20 questions)	<i>Link to be provided upon sign-up</i>	3.00
	2	Complete Part 2 of Final Power PE Exam (20 questions)	<i>Link to be provided upon sign-up</i>	3.00
	3	Complete Part 3 of Final Power PE Exam (20 questions)	<i>Link to be provided upon sign-up</i>	3.00
	4	Complete Part 4 of Final Power PE Exam (20 questions)	<i>Link to be provided upon sign-up</i>	3.00
	5	Check solutions	Solutions released after you submit your answers.	4.00
			Total:	16.00