

APPENDIX A:

Core Curriculum: Course Summary and Credit Summary:

Electrical Training IBEW-NECA Alliance:

Core Curriculum

Course Level and Credit Summary

Unnamed



Core Curriculum: Credit Summary Per Year

1st Year	
Core	34.5
Advanced	2
Local Advanced	0
Application	2
Total	38.5

2nd Year	
Core	30.5
Advanced	2.5
Local Advanced	0
Application	2
Total	35

3rd Year	
Core	20.5
Advanced	13
Local Advanced	0
Application	0
Total	33.5

4th Year	
Core	4
Advanced	31.5
Local Advanced	0
Application	0
Total	35.5

Grand Totals	
Total Core Credits	89.5
Total Advanced Credits	49
Total Local Advanced Credits	0
Total Application Credits	4
Total Credits	142.5

Core Curriculum: Course Selection Per Year

1st Year Core	
Orientation, Level I	2
Job Information 1, Level I, Based on the 2020 NEC	3
Conduit Fabrication, Level I - 2nd Ed.	3
Job Information 1, Level II, Based on the 2020 NEC	3
Codeology, Based on the 2020 NEC	3
DC Theory, Level I - 2nd Ed.	3
DC Theory, Level II - 2nd Ed.	3
DC Theory, Level III - 2nd Ed.	2
DC Theory, Level IV - 2nd Ed.	2
DC Theory, Level V - 2nd Ed.	2
Code, Standards, and Practices 1, Based on the 2020 NEC	4
Blueprints, Level I	2.5
Code, Standards, and Practices 2, Level I, Based on the 2020 NEC	2
Code, Standards, and Practices 2, Level II, Based on the 2020 NEC	2
Electrical Industry Applications Manual, Lesson 1-Splicing Conductors	0.25
Electrical Industry Applications Manual, Lesson 2-Installing a Duplex Receptacle	0.25
Electrical Industry Applications Manual, Lesson 3-Installing a Single Pole Switch	0.25
Electrical Industry Applications Manual, Lesson 4-Installing a Switched Duplex Receptacle	0.25
Electrical Industry Applications Manual, Lesson 8-Using a Hacksaw	0.25
Electrical Industry Applications Manual, Lesson 9-Lifting and Carrying Conduit	0.25
Electrical Industry Applications Manual, Lesson 11-Hand Bending a 90° Stub-up	0.25
Electrical Industry Applications Manual, Lesson 12-Hand Bending a Box Offset	0.25

2nd Year Core	
Orientation, Level II	1.5
Conduit Fabrication, Level II - 2nd Ed.	4
AC Systems, Level I - 3rd Ed.	2
AC Theory, Level I - 3rd Ed.	3
AC Theory, Level II - 3rd Ed.	4
AC Theory, Level III - 3rd Ed.	3
Electrical Code Calculations, Level I, Based on the 2020 NEC	1
Code, Standards, and Practices 3, Based on the 2020 NEC	2
Electrical Safety-Related Work Practices, Level I, Based on the 2021 70E	2
Electrical Safety-Related Work Practices, Level II, Based on the 2021 70E	2
Code, Standards, and Practices 6, Based on the 2020 NEC	1.5
Transformers, Level I - 2nd Ed.	2
Transformers, Level II, Based on the 2020 NEC - 2nd Ed.	2
Transformers, Level III - 2nd Ed.	1
Blueprints, Level II	2
Electrical Industry Applications Manual, Lesson 5-Proper Device Installation Techniques, GFCI Rough-In	0.25
Electrical Industry Applications Manual, Lesson 6-Using Anchors to Install a Metal Enclosure	0.25
Electrical Industry Applications Manual, Lesson 10-Erecting an Extension Ladder	0.25
Electrical Industry Applications Manual, Lesson 13-Cutting a Hole in a Metal Enclosure for an EMT Connector	0.25
Electrical Industry Applications Manual, Lesson 15-Threading Conduit (Tapered Thread)	0.25
Electrical Industry Applications Manual, Lesson 16-Installing Flexible Metallic Conduit	0.25
Electrical Industry Applications Manual, Lesson 17-Installing Armor Clad and Metal Clad Cables	0.25
Electrical Industry Applications Manual, Lesson 20-Wire Pulling Techniques	0.25

3rd Year Core	
Rigging, Hoisting, and Signaling, Level I	2
Blueprints, Level III	1
Torque, Level I	0.5
Grounding and Bonding, Level I, Based on the 2020 NEC	2
Grounding and Bonding, Level II, Based on the 2020 NEC	2.5
Test Instruments, Level I	2
Preparing for Leadership: Personal Qualities, Level I	2
Motors, Level I - 2nd Ed.	0.5
Motors, Level II, Based on the 2020 NEC - 2nd Ed.	1.5
Motors, Level III - 2nd Ed.	2
Motor Control, Level I	3.5
Motor Control, Level II	4
Motor Control, Level III	1.5
Code, Standards, and Practices 4, Based on the 2020 NEC	1
Fire Alarm Systems, Level I, Based on the 2020 NEC	2
Hazardous Locations, Based on the 2020 NEC	2
Building Automation 1: Control Devices and Applications, Level I	1.5
Building Automation 2: System Integration with Open Protocols, Level I B	2

Core Curriculum: Course Selection Per Year

4th Year Core	
Orientation, Level III	1
Lighting Essentials, Level I - 2nd Ed.	1.5
Lighting Essentials, Level II - 2nd Ed.	1.5
Lightning Protection, Level I	1
Code, Standards, and Practices 5, Based on the 2020 NEC	2
Digital Electronics, Level I	5
Introduction to Programmable Logic Controllers	4.5
Instrumentation Introduction - Module 1	2
Instrumentation Introduction - Module 2: Basics	5
Structured Cabling - 2nd Ed.	3
Intrusion Detection, Level I - 2nd Ed.	1.5
Health Care Facility Electrical Systems, Level I, Based on the 2021 NFPA 99 and 2020 NEC	1
Electrical Code Calculations, Level II, Based on the 2020 NEC	1
Power Quality, Level I	2
Distributed Generation, Level I	0.5
Photovoltaics, Level I	3

Core Curriculum: 1st Year Core Courses

	Credits	Page
Orientation, Level I		
J200LM.I1	2	2
Job Information 1, Level I, Based on the 2020 NEC		
J221LM.N1	3	3
Conduit Fabrication, Level I - 2nd Ed.		
J204LM.H1	3	4
Job Information 1, Level II, Based on the 2020 NEC		
J221LM.N2	3	5
Codeology, Based on the 2020 NEC		
J207LM.L	3	6
DC Theory, Level I - 2nd Ed.		
J202LM.K1	3	7
DC Theory, Level II - 2nd Ed.		
J202LM.K2	3	8
DC Theory, Level III - 2nd Ed.		
J202LM.K3	2	8
DC Theory, Level IV - 2nd Ed.		
J202LM.K4	2	9
DC Theory, Level V - 2nd Ed.		
J202LM.K5	2	9
Code, Standards, and Practices 1, Based on the 2020 NEC		
J231LM.L	4	10
Blueprints, Level I		
J244LM.I1	2.5	11
Code, Standards, and Practices 2, Level I, Based on the 2020 NEC		
J232LM.L1	2	11
Code, Standards, and Practices 2, Level II, Based on the 2020 NEC		
J232LM.L2	2	12
Electrical Industry Applications Manual, Lesson 1-Splicing Conductors		
≡ J300.K	0.25	1
Electrical Industry Applications Manual, Lesson 2-Installing a Duplex Receptacle		
≡ J300.K	0.25	1

Core Curriculum: 1st Year Core Courses cont.

Electrical Industry Applications Manual, Lesson 3-Installing a Single Pole Switch

≡ J300.K	0.25	1
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Electrical Industry Applications Manual, Lesson 4-Installing a Switched Duplex Receptacle

≡ J300.K	0.25	1
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Electrical Industry Applications Manual, Lesson 8-Using a Hacksaw

≡ J300.K	0.25	1
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Electrical Industry Applications Manual, Lesson 9-Lifting and Carrying Conduit

≡ J300.K	0.25	1
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Electrical Industry Applications Manual, Lesson 11-Hand Bending a 90° Stub-up

≡ J300.K	0.25	1
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Electrical Industry Applications Manual, Lesson 12-Hand Bending a Box Offset

≡ J300.K	0.25	1
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Core Curriculum: 1st Year Required Materials

Required Materials:

- *Blueprint Reading for Electricians Textbook (S648)*
- *Codeology Textbook (S01720)*
- *Conduit Lab Manual (J204L)*
- *Electrical Systems Textbook (S1070)*
- *National Electrical Code - 2017 (S950)*
- *Residential Blueprints (S135.H)*
- *TI-30X IIS Solar Calculator (S159)*
- *Building a Foundation in Mathematics (S665)*
- *Conduit Bending and Fabrication Textbook (S495)*
- *DC Theory Textbook (S640)*
- *National Electrical Code - 2014 (S750)*
- *National Electrical Code - 2020 (S1050)*
- *Test Instruments and Applications Textbook (S571)*
- *Ugly's Electrical References (S1054)*

Core Curriculum: 2nd Year Core Courses

	Credits	Page
Orientation, Level II		
J200LM.I2	1.5	12
Conduit Fabrication, Level II - 2nd Ed.		
J204LM.H2	4	13
AC Systems, Level I - 3rd Ed.		
J103LM.K1	2	13
AC Theory, Level I - 3rd Ed.		
J203LM.K1	3	14
AC Theory, Level II - 3rd Ed.		
J203LM.K2	4	15
AC Theory, Level III - 3rd Ed.		
J203LM.K3	3	16
Electrical Code Calculations, Level I, Based on the 2020 NEC		
J227LM.L1	1	17
Code, Standards, and Practices 3, Based on the 2020 NEC		
J233LM.L	2	18
Electrical Safety-Related Work Practices, Level I, Based on the 2021 70E		
J444LM.M1	2	18
Electrical Safety-Related Work Practices, Level II, Based on the 2021 70E		
J444LM.M2	2	19
Code, Standards, and Practices 6, Based on the 2020 NEC		
J236LM.L	1.5	19
Transformers, Level I - 2nd Ed.		
J205LM.I1	2	20
Transformers, Level II, Based on the 2020 NEC - 2nd Ed.		
J205LM.I2_20	2	20
Transformers, Level III - 2nd Ed.		
J205LM.I3	1	21
Blueprints, Level II		
J244LM.I2	2	21
Electrical Industry Applications Manual, Lesson 5-Proper Device Installation Techniques, GFCI Rough-In		
≡ J300.K	0.25	1

Core Curriculum: 2nd Year Core Courses cont.

Electrical Industry Applications Manual, Lesson 6-Using Anchors to Install a Metal Enclosure

≡ J300.K	0.25	1
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Electrical Industry Applications Manual, Lesson 10-Erecting an Extension Ladder

≡ J300.K	0.25	1
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Electrical Industry Applications Manual, Lesson 13-Cutting a Hole in a Metal Enclosure for an EMT Connector

≡ J300.K	0.25	1
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Electrical Industry Applications Manual, Lesson 15-Threading Conduit (Tapered Thread)

≡ J300.K	0.25	1
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Electrical Industry Applications Manual, Lesson 16-Installing Flexible Metallic Conduit

≡ J300.K	0.25	1
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Electrical Industry Applications Manual, Lesson 17-Installing Armor Clad and Metal Clad Cables

≡ J300.K	0.25	1
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Electrical Industry Applications Manual, Lesson 20-Wire Pulling Techniques

≡ J300.K	0.25	1
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Core Curriculum: 2nd Year Required Materials

Required Materials:

- *AC Theory Textbook (S641)*
- *Building a Foundation in Mathematics (S665)*
- *Commercial Blueprints (S136.H)*
- *Conduit Lab Manual (J204L)*
- *Electrical Systems Textbook (S1070)*
- *National Electrical Code - 2020 (S1050)*
- *Transformers Principles and Applications Textbook (S476)*
- *Blueprint Reading for Electricians Textbook (S648)*
- *Code Calculations Textbook - 2020 (S00820)*
- *Conduit Bending and Fabrication Textbook (S495)*
- *Electrical Safety-Related Work Practices Textbook (S944)*
- *National Electrical Code - 2017 (S950)*
- *Test Instruments and Applications Textbook (S571)*

These are materials that would have been bought previously based on this worksheet:

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|---|--------------------------|
| • <i>Blueprint Reading for Electricians Textbook (S648)</i> | <i>Purchased, Year 1</i> |
| • <i>Building a Foundation in Mathematics (S665)</i> | <i>Purchased, Year 1</i> |
| • <i>Conduit Bending and Fabrication Textbook (S495)</i> | <i>Purchased, Year 1</i> |
| • <i>Conduit Lab Manual (J204L)</i> | <i>Purchased, Year 1</i> |
| • <i>Electrical Systems Textbook (S1070)</i> | <i>Purchased, Year 1</i> |
| • <i>National Electrical Code - 2017 (S950)</i> | <i>Purchased, Year 1</i> |
| • <i>National Electrical Code - 2020 (S1050)</i> | <i>Purchased, Year 1</i> |
| • <i>Test Instruments and Applications Textbook (S571)</i> | <i>Purchased, Year 1</i> |

Core Curriculum: 3rd Year Core Courses

	Credits	Page
Rigging, Hoisting, and Signaling, Level I		
J241LM.J1	2	22
Blueprints, Level III		
J244LM.I3	1	23
Torque, Level I		
J242LM.1	0.5	23
Grounding and Bonding, Level I, Based on the 2020 NEC		
J210LM.L1	2	24
Grounding and Bonding, Level II, Based on the 2020 NEC		
J210LM.L2	2.5	25
Test Instruments, Level I		
J285LM.H1	2	26
Preparing for Leadership: Personal Qualities, Level I		
J900LM	2	27
Motors, Level I - 2nd Ed.		
J206LM.J1	0.5	28
Motors, Level II, Based on the 2020 NEC - 2nd Ed.		
J206LM.J2_20	1.5	29
Motors, Level III - 2nd Ed.		
J206LM.J3	2	30
Motor Control, Level I		
J209LM.H1	3.5	31
Motor Control, Level II		
J209LM.H2	4	32
Motor Control, Level III		
J209LM.H3	1.5	33
Code, Standards, and Practices 4, Based on the 2020 NEC		
J234LM.L	1	33
Fire Alarm Systems, Level I, Based on the 2020 NEC		
J211LM.L1	2	34
Hazardous Locations, Based on the 2020 NEC		
J257LM.L	2	35

Core Curriculum: 3rd Year Core Courses cont.

Building Automation 1: Control Devices and Applications, Level I

J238LM.H1	1.5	36
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Building Automation 2: System Integration with Open Protocols, Level I B

J239LM.I1B	2	37
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Core Curriculum: 3rd Year Required Materials

Required Materials:

- *Blueprint Reading for Electricians Textbook (S648)*
- *Building Automation: System Integration (S519)*
- *Effective Leadership Skills Textbook (S097)*
- *Fire Alarm Textbook (S946)*
- *Grounding and Bonding Textbook (S36820)*
- *Motors Textbook (S649)*
- *Rigging, Hoisting, Signaling Practices Textbook (S661)*
- *Building Automation: Control Devices (S518)*
- *Code Calculations Textbook - 2020 (S00820)*
- *Electrical Systems Textbook (S1070)*
- *Fundamentals of Motor Control (S547)*
- *Industrial Blueprints (S137)*
- *National Electrical Code - 2020 (S1050)*
- *Test Instruments and Applications Textbook (S571)*

These are materials that would have been bought previously based on this worksheet:

- | | |
|---|--------------------------|
| • <i>Blueprint Reading for Electricians Textbook (S648)</i> | <i>Purchased, Year 1</i> |
| • <i>Code Calculations Textbook - 2020 (S00820)</i> | <i>Purchased, Year 2</i> |
| • <i>Electrical Systems Textbook (S1070)</i> | <i>Purchased, Year 1</i> |
| • <i>National Electrical Code - 2020 (S1050)</i> | <i>Purchased, Year 1</i> |
| • <i>Test Instruments and Applications Textbook (S571)</i> | <i>Purchased, Year 1</i> |

Core Curriculum: 4th Year Core Courses

	Credits	Page
Orientation, Level III		
J200LM.I3	1	38
Lighting Essentials, Level I - 2nd Ed.		
J259LM.K1	1.5	38
Lighting Essentials, Level II - 2nd Ed.		
J259LM.K2	1.5	39
Lightning Protection, Level I		
J276LM.J1	1	39
Code, Standards, and Practices 5, Based on the 2020 NEC		
J235LM.L	2	40
Digital Electronics, Level I		
J240LM.I1	5	40
Introduction to Programmable Logic Controllers		
J162LM	4.5	41
Instrumentation Introduction - Module 1		
J126LM	2	42
Instrumentation Introduction - Module 2: Basics		
J134LM	5	43
Structured Cabling - 2nd Ed.		
J271LM.J1	3	44
Intrusion Detection, Level I - 2nd Ed.		
J146LM.A1	1.5	45
Health Care Facility Electrical Systems, Level I, Based on the 2021 NFPA 99 and 2020 NEC		
J260LM.L1	1	45
Electrical Code Calculations, Level II, Based on the 2020 NEC		
J227LM.L2	1	46
Power Quality, Level I		
J228LM.I1	2	47
Distributed Generation, Level I		
J229LM.I1	0.5	48
Photovoltaics, Level I		
≡ J230IG.J	3	49

Core Curriculum: 4th Year Required Materials

Required Materials:

- *Applied Science of Instrumentation Textbook (S600)*
- *Health Care Systems Textbook (S898)*
- *Lighting Design Basics Textbook (S699)*
- *National Electrical Code - 2020 (S1050)*
- *Photovoltaic Systems Textbook, 3rd Ed. (S674)*
- *Significant Changes to the NEC (S1053)*
- *Code Calculations Textbook - 2020 (S00820)*
- *Intro to Programmable Logic Controllers Textbook (S531)*
- *National Electrical Code - 2011 (S650)*
- *OSHA Standards for the Construction Industry (S125)*
- *Power Quality Textbook (S569)*
- *Structured Cabling Textbook (S681)*

These are materials that would have been bought previously based on this worksheet:

- *Code Calculations Textbook - 2020 (S00820)* *Purchased, Year 2*
- *National Electrical Code - 2020 (S1050)* *Purchased, Year 1*

Core Curriculum: Course Level and Credit Summary

Applications Manual

Item Code: **J300.K**

Core Curriculum Year: 1 and 2

Core Credits

Advanced Credits

Level I/II

Course Prerequisite(s): None

Required Material(s): None

Lesson 1	Splicing Conductors	0.25
Lesson 2	Installing a Duplex Receptacle	0.25
Lesson 3	Installing a Single Pole Switch	0.25
Lesson 4	Installing a Switched Duplex Receptacle	0.25
Lesson 5	Proper Device Installation Techniques, GFCI Rough-In	0.25
Lesson 6	Using Anchors to Install a Metal Enclosure	0.25
Lesson 7	Installing a Retrofit "Old Work" Electrical Box	0.25
Lesson 8	Using a Hacksaw	0.25
Lesson 9	Lifting and Carrying Conduit	0.25
Lesson 10	Erecting an Extension Ladder	0.25
Lesson 11	Hand Bending a 90° Stub-up	0.25
Lesson 12	Hand Bending a Box Offset	0.25
Lesson 13	Cutting a Hole in a Metal Enclosure for an EMT Connector	0.25
Lesson 14	Installing a Raceway Support System (Trapeze)	0.25
Lesson 15	Threading Conduit (Tapered Thread)	0.25
Lesson 16	Installing Flexible Metallic Conduit	0.25
Lesson 17	Installing Armor Clad and Metal Clad Cables	0.25
Lesson 18	Installing a Luminaire (Recessed "Can" Fixture)	0.25
Lesson 19	Installing a Luminaire (2' x 4' Fluorescent)	0.25
Lesson 20	Wire Pulling Techniques	0.25
Lesson 21	Terminating a Category 5e or 6/6A Work Area Outlet	0.25
Lesson 22	Labeling and Marking	0.25
Lesson 23	"Trimming Out" an Electrical Panel	0.25
Lesson 24	Exothermic Welding of Copper Conductors	0.25
Lesson 25	Connecting a Dual-Voltage, Wye-Wound Motor	0.25

ATTENTION: Your JATC will choose four out of the 25 Applications Manual lessons to be presented to students during the first year, and four out of the remaining Applications to be presented to students during the second year. Any Applications presented above the four per year must be matched with additional classroom time beyond 180 hours.

Core Curriculum: Course Level and Credit Summary

Orientation, Level I

Item Code: J200LM.I1

Core Curriculum Year: 1

Core Credits

Advanced Credits

2.0

Course Prerequisite(s): None

Other Prerequisites: None

Required Material(s):

- Lesson 1 How to Study This Course and Achieve Your Personal Goals
- Lesson 2 The Attributes of an IBEW/NECA Apprenticeship
- Lesson 3 Knowing Your Apprenticeship and Your Responsibilities
- Lesson 4 The IBEW and Its History
- Lesson 5 NECA's Structure and Heritage
- Lesson 6 Your Job and the Future It Holds for You
- Lesson 7 Sexual Harassment
- Lesson 8 The Economics of Employment
- Lesson 9 Safety Never Takes a Break

Core Curriculum: Course Level and Credit Summary

Job Information 1, Level I, Based on the 2020 NEC

Item Code: J221LM.N1

Core Curriculum Year: 1

Core Credits

Advanced Credits

3.0

Course Prerequisite(s): None

Other Prerequisites: None

Required Material(s):

- *National Electrical Code - 2020 (S1050)*
- *DC Theory Textbook (S640)*
- *Electrical Systems Textbook (S1070)*

- Lesson 1 Identifying Some Basic Tools of the Trade
- Lesson 2 The Workplace of an Electrical Worker
- Lesson 3 The Proper Care and Use of Ladders
- Lesson 4 Choosing and Installing the Correct Masonry Fastener
- Lesson 5 Alignment and Measurement
- Lesson 6 The Reality of Electrical Shock
- Lesson 7 Electrical Safety
- Lesson 8 Understanding The Function and Design of Ground-Fault Interrupters
- Lesson 9 CAUTION: Overhead Work in Progress
- Lesson 10 Using and Installing Twist-On Wire Connectors

Core Curriculum: Course Level and Credit Summary

Conduit Fabrication, Level I - 2nd Ed.

Item Code: J204LM.H1

Core Curriculum Year: 1

Core Credits

Advanced Credits

3.0

Course Prerequisite(s): None

Other Prerequisites: None

Notifications:

This course replaces Conduit Fabrication, Level I - 1st Ed.

Required Material(s):

- *Building a Foundation in Mathematics (S665)*
- *Conduit Bending and Fabrication Textbook (S495)*
- *National Electrical Code - 2017 (S950)*
- *Conduit Lab Manual (J204L)*

- Lesson 1 How to Work with Fractions
- Lesson 2 Using Basic Trigonometric Functions
- Lesson 3 Introduction to Conduit Bending
- Lesson 4 Conduit Types
- Lesson 5 Hand Fabrication of 90° Stubs
- Lesson 6 Hand Fabrication of Back-to-Back Bends
- Lesson 7 Hand Bending Offsets and Kicks
- Lesson 8 Hand Bending—Three- & Four-Bend Saddles

Core Curriculum: Course Level and Credit Summary

Job Information 1, Level II, Based on the 2020 NEC

Item Code: J221LM.N2

Core Curriculum Year: 1

Core Credits

Advanced Credits

3.0

Course Prerequisite(s): Job Information 1, Level I

Other Prerequisites: None

Required Material(s):

- *Electrical Systems Textbook (S1070)*
- *National Electrical Code - 2020 (S1050)*
- *TI-30X IIS Solar Calculator (S159)*
- *DC Theory Textbook (S640)*
- *Building a Foundation in Mathematics (S665)*

- Lesson 1 Building Wire Construction and Insulation Properties
- Lesson 2 How Building Wire is Sized
- Lesson 3 Working Properly With Aluminum Conductors
- Lesson 4 Identifying Commonly Used Electrical Materials
- Lesson 5 Working with Prefixes and Powers of 10
- Lesson 6 Using the Metric System and Metrication Changes
- Lesson 7 How to Solve Basic Algebraic Equations
- Lesson 8 Introduction to Firestopping
- Lesson 9 Fire-Resistant Wall and Floor Assembly Penetrations
- Lesson 10 Firestop Applications
- Lesson 11 Wire-Pulling Techniques

Core Curriculum: Course Level and Credit Summary

Codeology, Based on the 2020 NEC

Item Code: J207LM.L

Core Curriculum Year: 1

Core Credits

Advanced Credits

3.0

Course Prerequisite(s): Job Information, Level I

Other Prerequisites: None

Required Material(s):

• *Codeology Textbook (S01720)*

• *National Electrical Code - 2020 (S1050)*

- Lesson 1 Overview, Organization, and Chapter 1 of the *National Electrical Code*
- Lesson 2 *NEC* Chapter 2: Planning the Installation
- Lesson 3 *NEC* Chapter 3: Building the Installation
- Lesson 4 *NEC* Chapter 4: Using the Electricity
- Lesson 5 *NEC* Chapter 5: Special Occupancies
- Lesson 6 *NEC* Chapter 6: Special Equipment of the *NEC*
- Lesson 7 *NEC* Chapter 7: Special Conditions
- Lesson 8 *NEC* Chapter 8: Communications
- Lesson 9 *NEC* Chapter 9: Tables and the Informative Annexes
- Lesson 10 The *Codeology* Method

Core Curriculum: Course Level and Credit Summary

DC Theory, Level I - 2nd Ed.

Item Code: J202LM.K1

Core Curriculum Year: 1

Core Credits

Advanced Credits

3.0

Course Prerequisite(s): None

Other Prerequisites: None

Required Material(s):

- ***DC Theory Textbook (S640)***

Lesson 1 What is Electricity?

Lesson 2 Electrical Energy Sources

Lesson 3 Electrical Switches

Lesson 4 Conductors, Conductor Resistance, and Wattage Loss

Lesson 5 Introduction to Electrical Devices

Lesson 6 Current, Voltage, and Resistance in a Circuit

Lesson 7 The Electrical Circuit and Ohm's Law

Lesson 8 Power in a Circuit

Core Curriculum: Course Level and Credit Summary

DC Theory, Level II - 2nd Ed.

Item Code: J202LM.K2

Core Curriculum Year: 1

Core Credits

Advanced Credits

3.0

Course Prerequisite(s): DC Theory, Level I - 2nd Ed.

Other Prerequisites: None

Required Material(s):

• *DC Theory Textbook (S640)*

• *Test Instruments and Applications Textbook (S571)*

- Lesson 1 The Series Circuit
- Lesson 2 Understanding and Calculating Resistance in DC Series Circuits
- Lesson 3 How Current Reacts in DC Series Circuits
- Lesson 4 How Voltage Functions in DC Series Circuits
- Lesson 5 How to Calculate Power in DC Series Circuits
- Lesson 6 Energized Circuits and the Potential Hazards They Possess
- Lesson 7 How to Draw Basic Electrical Circuits Correctly
- Lesson 8 Introduction to Test Instruments

DC Theory, Level III - 2nd Ed.

Item Code: J202LM.K3

Core Curriculum Year: 1

Core Credits

Advanced Credits

2.0

Course Prerequisite(s): DC Theory, Level II - 2nd Ed.

Other Prerequisites: None

Required Material(s):

• *DC Theory Textbook (S640)*

• *Building a Foundation in Mathematics (S665)*

- Lesson 1 How Current Reacts in DC Parallel Circuits
- Lesson 2 Understanding Resistance in DC Parallel Circuits
- Lesson 3 Working with Ratios and Proportion
- Lesson 4 How Voltage Functions in DC Parallel Circuits
- Lesson 5 How to Calculate Power in DC Parallel Circuits

Core Curriculum: Course Level and Credit Summary

DC Theory, Level IV - 2nd Ed.

Item Code: J202LM.K4

Core Curriculum Year: 1

Core Credits

Advanced Credits

2.0

Course Prerequisite(s): DC Theory, Level III - 2nd Ed.

Other Prerequisites: None

Required Material(s):

• *DC Theory Textbook (S640)*

• *National Electrical Code - 2017 (S950)*

- Lesson 1 Understanding Resistance in DC Combination Circuits
- Lesson 2 How Current Reacts in DC Combination Circuits
- Lesson 3 How Voltage Functions in DC Combination Circuits
- Lesson 4 How to Calculate Power in DC Combination Circuits
- Lesson 5 How Voltage and Current Dividers Work
- Lesson 6 The Design and Operation of the 3-Wire, Single-Phase System

DC Theory, Level V - 2nd Ed.

Item Code: J202LM.K5

Core Curriculum Year: Advanced

Advanced Credits

2.0

Course Prerequisite(s): DC Theory, Level I/IV

Other Prerequisites: None

Required Material(s):

• *DC Theory Textbook (S640)*

• *National Electrical Code - 2014 (S750)*

- Lesson 1 Applying the Principle of Superposition to Circuit Calculations
- Lesson 2 Kirchhoff's Laws
- Lesson 3 Thevenin's and Norton's Theorems
- Lesson 4 Understanding the Principles of Magnetism
- Lesson 5 Understanding the Principles of Electromagnetism
- Lesson 6 DC Generators and Motors
- Lesson 7 Using DC Theory to Solve Real World Problems

Core Curriculum: Course Level and Credit Summary

Code, Standards, and Practices 1, Based on the 2020 NEC

Item Code: J231LM.L

Core Curriculum Year: 1

Core Credits

Advanced Credits

4.0

Course Prerequisite(s): None

Other Prerequisites: None

Required Material(s):

- *National Electrical Code - 2020 (S1050)*
- *Electrical Systems Textbook (S1070)*
- *Ugly's Electrical References (S1054)*

- Lesson 1 An Introduction to the *National Electrical Code*
- Lesson 2 Interpreting the Language of the *NEC*—Article 100
- Lesson 3 Understanding and Applying Article 110 of the *NEC*
- Lesson 4 Understanding and Applying Article 110 of the *NEC* II
- Lesson 5 General Building Wire Properties and the *NEC*
- Lesson 6 Understanding Conductor Insulation and *NEC* Specifications
- Lesson 7 Introduction to Wiring Devices
- Lesson 8 General Requirements Related to Installing Wiring Devices
- Lesson 9 General Requirements Related to Installing Industrial Wiring Devices
- Lesson 10 Specific Receptacle Installation Requirements
- Lesson 11 Specific Switch Installation Requirements

Core Curriculum: Course Level and Credit Summary

Blueprints, Level I

Item Code: J244LM.I1

Core Curriculum Year: 1

Core Credits

Advanced Credits

2.5

Course Prerequisite(s): Code and Practices 1, Level I

Other Prerequisites: None

Required Material(s):

- *Blueprint Reading for Electricians Textbook (S648)*
- *Residential Blueprints (S135.H)*

- Lesson 1 The Fundamentals of Blueprint Drawing and How to Make Proper Sketches
- Lesson 2 Understanding Architectural Views and How to Draw Them
- Lesson 3 Recognizing and Understanding Common Scales Used on Blueprints
- Lesson 4 ICP 1: Math for Blueprint Reading
- Lesson 5 Using Blueprints Specifications, Elevations and Schedules Properly
- Lesson 6 Understanding and Drawing Electrical Symbols Used on Blueprints
- Lesson 7 Understanding and Drawing Mechanical Symbols Used on Blueprints
- Lesson 8 Understanding How to Properly Use a Residential Blueprint
- Lesson 9 Reading and Analyzing a Residential Blueprint

Code, Standards, and Practices 2, Level I, Based on the 2020 NEC

Item Code: J232LM.L1

Core Curriculum Year: 1

Core Credits

Advanced Credits

2.0

Course Prerequisite(s): Code, Standards, and Practices 1, Level I

Other Prerequisites: None

Required Material(s):

- *National Electrical Code - 2020 (S1050)*
- *Electrical Systems Textbook (S1070)*

- Lesson 1 Understanding the Principles Involved in the Sizing of Building Wire
- Lesson 2 Branch Circuits I
- Lesson 3 Branch Circuits II
- Lesson 4 Feeders and Outside Branch Circuits and Feeders
- Lesson 5 Services
- Lesson 6 Switches, Receptacles, and Luminaires

Core Curriculum: Course Level and Credit Summary

Code, Standards, and Practices 2, Level II, Based on the 2020 NEC

Item Code: J232LM.L2

Core Curriculum Year: 1

Core Credits

Advanced Credits

2.0

Course Prerequisite(s): Code, Standards, and Practices 2, Level I

Other Prerequisites: None

Required Material(s):

• *National Electrical Code - 2020 (S1050)*

• *Electrical Systems Textbook (S1070)*

- Lesson 1 Conduit and Raceway Basics
- Lesson 2 NEC Requirements for Cable Assemblies
- Lesson 3 General Requirements for Wiring Methods and Materials
- Lesson 4 Conductors for General Wiring
- Lesson 5 Electrical Nonmetallic Tubing (ENT)
- Lesson 6 Liquidtight Flexible Conduit: Types LFMC and LFNC

Orientation, Level II

Item Code: J200LM.I2

Core Curriculum Year: 2

Core Credits

Advanced Credits

1.5

Course Prerequisite(s): Orientation, Level I

Other Prerequisites: None

Required Material(s):

- Lesson 1 Avoiding the Hazards of Drug Abuse
- Lesson 2 Becoming Familiar with the IBEW Constitution
- Lesson 3 Understanding Your Local Union By-Laws
- Lesson 4 Parliamentary Procedure and How It Works
- Lesson 5 An Introduction to The COMET Program
- Lesson 6 American Labor History
- Lesson 7 Pride in Your Industry

Core Curriculum: Course Level and Credit Summary

Conduit Fabrication, Level II - 2nd Ed.

Item Code: J204LM.H2

Core Curriculum Year: 2

Core Credits

Advanced Credits

4.0

Course Prerequisite(s): Conduit Fabrication, Level I - 2nd Ed

Other Prerequisites: None

Notifications:

This course replaces Conduit Fabrication, Level II - 1st Ed.

Required Material(s):

- *Conduit Bending and Fabrication Textbook (S495)*
- *Conduit Lab Manual (J204L)*

Lesson 1 Conduit Threading Techniques

Lesson 2 Push-Through Bending: 90° Bends

Lesson 3 Bending Kicks, Offsets and Saddles Using the Push-Through Method

Lesson 4 Segmented Bends

AC Systems, Level I - 3rd Ed.

Item Code: J103LM.K1

Core Curriculum Year: 2

Core Credits

Advanced Credits

2.0

Course Prerequisite(s): DC Theory, Level I/IV

Other Prerequisites: None

Required Material(s):

- *AC Theory Textbook (S641)*
- *National Electrical Code - 2017 (S950)*
- *Building a Foundation in Mathematics (S665)*

Lesson 1 Reviewing the Applications of DC Theory

Lesson 2 Understanding Vectors and How to Use Them Effectively

Lesson 3 Comparing Direct Current To Alternating Current

Lesson 4 Making Circuit Calculations for Basic Systems

Lesson 5 Becoming Familiar with AC Resistive Circuits

Lesson 6 Understanding the Basic Characteristics of AC Circuits

Core Curriculum: Course Level and Credit Summary

AC Theory, Level I - 3rd Ed.

Item Code: J203LM.K1

Core Curriculum Year: 2

Core Credits

Advanced Credits

3.0

Course Prerequisite(s): DC Theory, Level I/IV; AC Systems, Level I

Other Prerequisites: None

Required Material(s):

- ***AC Theory Textbook (S641)***

- Lesson 1 Understanding Inductance and How It Affects a Circuit
- Lesson 2 Working with Inductors that are in Series and/or Parallel
- Lesson 3 Becoming Familiar with Inductive Reactance
- Lesson 4 Understanding Capacitance and How it Affects a Circuit
- Lesson 5 Understanding and Working Safely With Capacitors
- Lesson 6 Working with Capacitors that are in Series and/or Parallel
- Lesson 7 Becoming Familiar with Capacitive Reactance

Core Curriculum: Course Level and Credit Summary

AC Theory, Level II - 3rd Ed.

Item Code: J203LM.K2

Core Curriculum Year: 2

Core Credits

Advanced Credits

4.0

Course Prerequisite(s): AC Theory

Other Prerequisites: None

Required Material(s):

• *AC Theory Textbook (S641)*

• *Building a Foundation in Mathematics (S665)*

- Lesson 1 Comprehending the Parameters of Series RL Circuits
- Lesson 2 Comprehending the Parameters of Series RC Circuits
- Lesson 3 Comprehending and Analyzing Series RLC Circuits
- Lesson 4 Understanding and Working with Parallel RL Circuits
- Lesson 5 Understanding and Working with Parallel RC Circuits
- Lesson 6 Comprehending and Analyzing Parallel RLC Circuits
- Lesson 7 Identifying and Working with LC Circuits
- Lesson 8 Comparing Series and Parallel RLC Circuits
- Lesson 9 Analyzing and Working with Combination RLC Circuits

Core Curriculum: Course Level and Credit Summary

AC Theory, Level III - 3rd Ed.

Item Code: J203LM.K3

Core Curriculum Year: 2

Core Credits

Advanced Credits

3.0

Course Prerequisite(s): AC Theory, Level I/II

Other Prerequisites: None

Required Material(s):

• *AC Theory Textbook (S641)*

• *Test Instruments and Applications Textbook (S571)*

- Lesson 1 Power Factor
- Lesson 2 Power Factor Correction
- Lesson 3 General Use Test Instruments
- Lesson 4 Electronic Circuit Test Instruments
- Lesson 5 Introduction to Generators
- Lesson 6 Understanding How the DC Generator Works
- Lesson 7 Understanding the Design and Function of AC Generators
- Lesson 8 An Introduction to 3-Phase Systems

Core Curriculum: Course Level and Credit Summary

Electrical Code Calculations, Level I, Based on the 2020 NEC

Item Code: J227LM.L1

Core Curriculum Year: 2

Core Credits

Advanced Credits

1.0

Course Prerequisite(s): Code, Standards, and Practices 2, Level II

Other Prerequisites: None

Required Material(s):

- *National Electrical Code - 2020 (S1050)*
- *Code Calculations Textbook - 2020 (S00820)*
- *Electrical Systems Textbook (S1070)*

- Lesson 1 Beginning to Calculate Conductor Ampacity
- Lesson 2 Determining Conductor Ampacity
- Lesson 3 Finalizing Ampacity Calculations
- Lesson 4 Identifying Boxes and Fittings as Defined by the *NEC*
- Lesson 5 Performing Box Size and Fill Calculations
- Lesson 6 Calculating Raceway Fill

Core Curriculum: Course Level and Credit Summary

Code, Standards, and Practices 3, Based on the 2020 NEC

Item Code: J233LM.L

Core Curriculum Year: 2	Core Credits 2.0	Advanced Credits
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Course Prerequisite(s): Code, Standards, and Practices 2, Level II

Other Prerequisites: None

Required Material(s):

- *National Electrical Code - 2020 (S1050)*

- Lesson 1 Purpose of Overcurrent Protection and Types of Overcurrents
- Lesson 2 Overcurrent Protective Device Categories
- Lesson 3 Overcurrent Protective Device Ratings
- Lesson 4 Types of OCPDs—Circuit Breakers
- Lesson 5 Types of OCPDs—Fuses
- Lesson 6 Practical Guidelines for OCPD Ampere Rating Sizing
- Lesson 7 Special Conductor Overcurrent Protection Permitted, Including Taps
- Lesson 8 Calculation of Available Fault Current
- Lesson 9 Panelboards, Switchboards, and Switchgear SCCR—NEC 408.6

Electrical Safety-Related Work Practices, Level I, Based on the 2021 70E

Item Code: J444LM.M1

Core Curriculum Year: 2	Core Credits 2.0	Advanced Credits
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Course Prerequisite(s): Code, Standards, and Practices 3, Level I

Other Prerequisites: None

Required Material(s):

- *Electrical Safety-Related Work Practices Textbook (S944)*

- Lesson 1 Electrical Safety Culture
- Lesson 2 Electrical Hazard Awareness
- Lesson 3 OSHA Considerations
- Lesson 4 Introduction to Lockout, Tagging, and the Control of Hazardous Energy
- Lesson 5 Fault Current Fundamentals

Core Curriculum: Course Level and Credit Summary

Electrical Safety-Related Work Practices, Level II, Based on the 2021 70E

Item Code: J444LM.M2

Core Curriculum Year: 2

Core Credits

Advanced Credits

2.0

Course Prerequisite(s): Electrical Safety-Related Work Practices, Level I

Other Prerequisites: None

Required Material(s):

- *Electrical Safety-Related Work Practices Textbook (S944)*

Lesson 1	Introduction to <i>NFPA 70E</i> ®
Lesson 2	Work Involving Electrical Hazards
Lesson 3	Identifying OCPD Types
Lesson 4	Methods to Select Arc Flash PPE
Lesson 5	Maintenance Considerations
Lesson 6	Eliminating or Reducing Hazards by Design and Upgrades

Code, Standards, and Practices 6, Based on the 2020 NEC

Item Code: J236LM.L

Core Curriculum Year: Advanced

Advanced Credits

1.5

Course Prerequisite(s): Code, Standards, and Practices 3, Level I

Other Prerequisites: None

Required Material(s):

- *National Electrical Code - 2020 (S1050)*

Lesson 1	Reviewing Key OCPD Concepts
Lesson 2	Motor Branch-Circuit Devices and Protection – <i>NEC</i> Article 430
Lesson 3	Motor Branch Circuits and Air-Conditioning and Refrigeration Equipment
Lesson 4	Transformer Protection—Article 450
Lesson 5	Interrupting Rating: Fully Rated and Series Rated Systems
Lesson 6	Equipment Short-Circuit Protection
Lesson 7	Selective Coordination
Lesson 8	Ground-Fault Protection of Equipment

Core Curriculum: Course Level and Credit Summary

Transformers, Level I - 2nd Ed.

Item Code: J205LM.I1

Core Curriculum Year: 2

Core Credits

Advanced Credits

2.0

Course Prerequisite(s): AC Theory, Level I/II; Code and Practices 2, Level I/II

Other Prerequisites: None

Required Material(s):

- *Transformers Principles and Applications Textbook (S476)*

- Lesson 1 Magnetism and Electromagnetism
- Lesson 2 Transformers Operation Principles
- Lesson 3 Transformer Connections
- Lesson 4 Real World Transformer Connections
- Lesson 5 Harmonics
- Lesson 6 Power Generation and Distribution

Transformers, Level II, Based on the 2020 NEC - 2nd Ed.

Item Code: J205LM.I2_20

Core Curriculum Year: 2

Core Credits

Advanced Credits

2.0

Course Prerequisite(s): Code Calc Lvl II OR Elec Code Calc Lvl I; Transformers, Level I

Other Prerequisites: None

Required Material(s):

- *Transformers Principles and Applications Textbook (S476)*
- *National Electrical Code - 2020 (S1050)*
- *Code Calculations Textbook - 2020 (S00820)*

- Lesson 1 Reactors and Isolation Transformers
- Lesson 2 Autotransformers
- Lesson 3 Buck-Boost Transformers
- Lesson 4 Understanding Transformer Overcurrent Protection
- Lesson 5 Transformer Overcurrent Protection with Associated Tap Rules

Core Curriculum: Course Level and Credit Summary

Transformers, Level III - 2nd Ed.

Item Code: J205LM.I3

Core Curriculum Year: Advanced

Advanced Credits

1.0

Course Prerequisite(s): Transformers, Level I

Other Prerequisites: None

Required Material(s):

- *Transformers Principles and Applications Textbook (S476)*

Lesson 1	Electrical Safety
Lesson 2	Special Transformers
Lesson 3	Special Connections
Lesson 4	Selection and Installation
Lesson 5	Maintenance and Troubleshooting

Blueprints, Level II

Item Code: J244LM.I2

Core Curriculum Year: 2

Core Credits

Advanced Credits

2.0

Course Prerequisite(s): Blueprints, Level I

Other Prerequisites: None

Required Material(s):

- *Blueprint Reading for Electricians Textbook (S648)*
- *Commercial Blueprints (S136.H)*

Lesson 1	Reviewing the Basic Fundamentals of Blueprints and How They are Drawn
Lesson 2	Analyzing and Laying-Out Residential Circuits
Lesson 3	Understanding Job Costs and How to Do an Actual Takeoff
Lesson 4	Understanding, Interpreting, and Evaluating Blueprint Specifications
Lesson 5	Interpreting Blueprint Schedules and Locating Components on the Print
Lesson 6	Becoming Familiar with Blueprint Systems Integration
Lesson 7	Learning How to Effectively Use Blueprints

Core Curriculum: Course Level and Credit Summary

Rigging, Hoisting, and Signaling, Level I

Item Code: J241LM.J1

Core Curriculum Year: 3

Core Credits

Advanced Credits

2.0

Course Prerequisite(s): None

Other Prerequisites: 4000 Hours of OJT

Required Material(s):

- *Rigging, Hoisting, Signaling Practices Textbook (S661)*

- Lesson 1 Hoisting Safety
- Lesson 2 Cranes
- Lesson 3 Lift Planning
- Lesson 4 Signaling
- Lesson 5 Load Weight and Balance
- Lesson 6 Slings and Sling Hitches
- Lesson 7 Rigging Equipment Maintenance
- Lesson 8 Rigging Hardware
- Lesson 9 Chains and Chain Slings
- Lesson 10 Synthetic Slings
- Lesson 11 Wire Rope and Wire Rope Slings
- Lesson 12 Fiber Rope and Knots
- Lesson 13 Block and Tackle
- Lesson 14 Hoists

Core Curriculum: Course Level and Credit Summary

Blueprints, Level III

Item Code: J244LM.I3

Core Curriculum Year: 3

Core Credits

Advanced Credits

1.0

Course Prerequisite(s): Blueprints, Level II

Other Prerequisites: None

Required Material(s):

• *Blueprint Reading for Electricians Textbook (S648)*

• *Industrial Blueprints (S137)*

Lesson 1 Review and Introduction

Lesson 2 Industrial Specifications

Lesson 3 Industrial Prints I

Lesson 4 Industrial Prints II

Lesson 5 Industrial Prints III

Torque, Level I

Item Code: J242LM.1

Core Curriculum Year: 3

Core Credits

Advanced Credits

0.5

Course Prerequisite(s): None

Other Prerequisites: 4000 Hours of OJT

Required Material(s):

Lesson 1 Torque Theory

Lesson 2 Threaded Fasteners Basics

Lesson 3 Introduction to Torque Applications

Lesson 4 Torque Products

Lesson 5 Real World Electrical Torque Applications

Core Curriculum: Course Level and Credit Summary

Grounding and Bonding, Level I, Based on the 2020 NEC

Item Code: J210LM.L1

Core Curriculum Year: 3

Core Credits

Advanced Credits

2.0

Course Prerequisite(s): AC Theory, Level II/III

Other Prerequisites: None

Required Material(s):

• *Grounding and Bonding Textbook (S36820)*

• *National Electrical Code - 2020 (S1050)*

- Lesson 1 Introduction
- Lesson 2 Circuit Basics and Overcurrent Protection
- Lesson 3 **Code** Arrangement and Application
- Lesson 4 Grounding Electrodes and the Grounding Electrode System
- Lesson 5 Requirements for Services and Grounded Conductors
- Lesson 6 Grounding Electrode Conductors
- Lesson 7 Bonding Requirements
- Lesson 8 Equipment Grounding Conductors (EGCs)
- Lesson 9 Grounding Electrical Equipment
- Lesson 10 Isolated (Insulated) Grounding Circuits and Receptacles

Core Curriculum: Course Level and Credit Summary

Grounding and Bonding, Level II, Based on the 2020 NEC

Item Code: J210LM.L2

Core Curriculum Year: 3

Core Credits

Advanced Credits

2.5

Course Prerequisite(s): Grounding and Bonding, Level I

Other Prerequisites: None

Required Material(s):

- ***Grounding and Bonding Textbook (S36820)***
- ***National Electrical Code - 2020 (S1050)***
- ***Test Instruments and Applications Textbook (S571)***

- Lesson 1 Grounding at Separate Buildings or Structures
- Lesson 2 Grounding Electrical Systems
- Lesson 3 Grounding Requirements for Separately Derived Systems
- Lesson 4 Special Occupancies and Conditions
- Lesson 5 Grounding Special Equipment
- Lesson 6 Grounding and Bonding for Communications Systems and Equipment
- Lesson 7 Ground-Fault Circuit Interrupters (GFCI) and Ground-Fault Protection of Equipment (GFPE)

- Lesson 8 Grounding Rules for Medium- and High-Voltage Systems
- Lesson 9 Grounding Systems and Earth Ground Test Instruments

Core Curriculum: Course Level and Credit Summary

Test Instruments, Level I

Item Code: J285LM.H1

Core Curriculum Year: Advanced

Advanced Credits

2.0

Course Prerequisite(s): AC Systems, Level I

Other Prerequisites: None

Required Material(s):

- *Test Instruments and Applications Textbook (S571)*

Lesson 1	Voice-Data-Video (VDV) Test Instruments
Lesson 2	Power Quality Test Instruments
Lesson 3	Medium (and High) Voltage and Insulation Test Instruments
Lesson 4	Instrumentation and Process Control Test Instruments
Lesson 5	Special Maintenance Test Instruments
Lesson 6	Troubleshooting

Core Curriculum: Course Level and Credit Summary

Preparing for Leadership: Personal Qualities, Level I

Item Code: J900LM

Core Curriculum Year: 3

Core Credits

Advanced Credits

2.0

Course Prerequisite(s): None

Other Prerequisites: 4000 Hours of OJT

Notifications:

Instructors must have satisfactorily completed the TTT version of this course to be enrolled into this

Required Material(s):

- ***Effective Leadership Skills Textbook (S097)***

- Lesson 1 The Contracting Business
- Lesson 2 Personal Qualities: Professionalism And Respect
- Lesson 3 Personal Qualities: Credibility and Character
- Lesson 4 Personal Qualities: Ethics and Integrity
- Lesson 5 Personal Qualities: Teaching and Learning
- Lesson 6 Planning: The Importance of Planning
- Lesson 7 Planning: Planning Challenges
- Lesson 8 Communications: Effective Communication
- Lesson 9 Communications: Crew Support and Morale
- Lesson 10 Communications: Disruptive Behaviors
- Lesson 11 Communications: Addressing Conflict

Core Curriculum: Course Level and Credit Summary

Motors, Level I - 2nd Ed.

Item Code: J206LM.J1

Core Curriculum Year: 3

Core Credits

Advanced Credits

0.5

Course Prerequisite(s): AC Theory, Level I/II; Code and Practices 3, Level I

Other Prerequisites: None

Required Material(s):

- ***Motors Textbook (S649)***

- Lesson 1 Magnetism and Induction
- Lesson 2 Motor Nameplates
- Lesson 3 AC Alternators
- Lesson 4 Three-Phase Motors
- Lesson 5 Squirrel-Cage Motors

Core Curriculum: Course Level and Credit Summary

Motors, Level II, Based on the 2020 NEC - 2nd Ed.

Item Code: J206LM.J2_20

Core Curriculum Year: 3

Core Credits

Advanced Credits

1.5

Course Prerequisite(s): Motors, Level I - 2nd Ed.

Other Prerequisites: None

Required Material(s):

- *Motors Textbook (S649)*
- *National Electrical Code - 2020 (S1050)*
- *Code Calculations Textbook - 2020 (S00820)*

- Lesson 1 Wound-Rotor Motors
- Lesson 2 Single-Phase Motors
- Lesson 3 Motor Protection
- Lesson 4 DC Motors and Generators
- Lesson 5 Starting
- Lesson 6 Motor Branch Circuits
- Lesson 7 Motor Branch-Circuit Protection
- Lesson 8 Motor Overload Protection
- Lesson 9 Sizing Motor Disconnect

Core Curriculum: Course Level and Credit Summary

Motors, Level III - 2nd Ed.

Item Code: J206LM.J3

Core Curriculum Year: Advanced

Advanced Credits

2.0

Course Prerequisite(s): Motors, Level I/II

Other Prerequisites: None

Required Material(s):

- ***Motors Textbook (S649)***

Lesson 1	Synchronous Motors
Lesson 2	Braking
Lesson 3	Multispeed Motors
Lesson 4	Adjustable-Speed Drives
Lesson 5	Bearings
Lesson 6	Drive Systems and Clutches
Lesson 7	Motor Alignment
Lesson 8	Troubleshooting Motors
Lesson 9	Special-Application Motors

Core Curriculum: Course Level and Credit Summary

Motor Control, Level I

Item Code: J209LM.H1

Core Curriculum Year: 3

Core Credits

Advanced Credits

3.5

Course Prerequisite(s): Motors, Level I/II

Other Prerequisites: None

Required Material(s):

- ***Fundamentals of Motor Control (S547)***

- Lesson 1 Introduction to Magnetic Motor Control
- Lesson 2 Manual Pilot Devices
- Lesson 3 Automatic Pilot Devices
- Lesson 4 Magnetic Control Relays
- Lesson 5 Control Transformers
- Lesson 6 Magnetic Contactors
- Lesson 7 Basic Motor Starters
- Lesson 8 Basic Timers
- Lesson 9 Control Diagrams and Drawings

Core Curriculum: Course Level and Credit Summary

Motor Control, Level II

Item Code: **J209LM.H2**

Core Curriculum Year: 3

Core Credits

Advanced Credits

4.0

Course Prerequisite(s): Motor Control, Level I

Other Prerequisites: None

Required Material(s):

• *Fundamentals of Motor Control (S547)*

- Lesson 1 Basic Electronics for Motor Control Devices
- Lesson 2 More Electronics for Motor Control Devices
- Lesson 3 Solid-State Motor Control Pilot Devices
- Lesson 4 Solid-State Relays
- Lesson 5 Motor Control Centers
- Lesson 6 Special Purpose Starters
- Lesson 7 Electronic Programmable Timers
- Lesson 8 Special Control Components
- Lesson 9 AC Motor Speed Control

Core Curriculum: Course Level and Credit Summary

Motor Control, Level III

Item Code: J209LM.H3

Core Curriculum Year: Advanced

Advanced Credits

1.5

Course Prerequisite(s): Motor Control, Level II

Other Prerequisites: None

Required Material(s):

- *Fundamentals of Motor Control (S547)*

Lesson 1	DC Motor Control
Lesson 2	Understanding Analog Signals
Lesson 3	Analog Pilot Devices
Lesson 4	Working With Solid-State Devices in Motor Control
Lesson 5	Variable Frequency Drives
Lesson 6	Programmable Logic Controllers
Lesson 7	Controlling Synchronous, Stepper, and Servo Motors
Lesson 8	Networked Motor Control
Lesson 9	Troubleshooting Electrical Systems

Code, Standards, and Practices 4, Based on the 2020 NEC

Item Code: J234LM.L

Core Curriculum Year: 3

Core Credits

Advanced Credits

1.0

Course Prerequisite(s): Code, Standards, and Practices 3, Level I

Other Prerequisites: None

Required Material(s):

- *National Electrical Code - 2020 (S1050)*
- *Electrical Systems Textbook (S1070)*

Lesson 1	Special Occupancies
Lesson 2	Electrical Equipment
Lesson 3	Special Equipment
Lesson 4	Introduction to Cable Tray Systems
Lesson 5	Installing Surface Metal Raceways

Core Curriculum: Course Level and Credit Summary

Fire Alarm Systems, Level I, Based on the 2020 NEC

Item Code: J211LM.L1

Core Curriculum Year: Advanced

Advanced Credits

2.0

Course Prerequisite(s): DC Theory, Level I/IV; Job Information, Level I

Other Prerequisites: None

Required Material(s):

• *Fire Alarm Textbook (S946)*

• *National Electrical Code - 2020 (S1050)*

Lesson 1	Introduction to Fire Alarm Systems
Lesson 2	Fundamentals and System Requirements
Lesson 3	Initiating Devices
Lesson 4	Notification Appliances
Lesson 5	Wiring and Wiring Methods
Lesson 6	System Interfaces and Safety Control Functions
Lesson 7	Emergency Communications Systems and Emergency Voice/Alarm Communications Systems
Lesson 8	Plans and Specifications

Core Curriculum: Course Level and Credit Summary

Hazardous Locations, Based on the 2020 NEC

Item Code: J257LM.L

Core Curriculum Year: Advanced

Advanced Credits

2.0

Course Prerequisite(s): Code and Practices 3, Level I

Other Prerequisites: None

Required Material(s):

Lesson 1	Hazardous (Classified) Location Concepts
Lesson 2	Article 500—Understanding Class I, II, and III Locations
Lesson 3	The Requirements for Electrical Installations in Class I Hazardous (Classified) Locations
Lesson 4	The Requirements for Electrical Installations in Class II Hazardous (Classified) Locations
Lesson 5	Requirements for Wiring in Class III Hazardous (Classified) Locations and Intrinsically Safe Systems
Lesson 6	Article 505—Zone 0, 1, and 2 Locations
Lesson 7	Article 506—Zone 20, 21, and 22 Locations for Combustible Dusts or Ignitable Fibers/Flyings
Lesson 8	Specific Locations—Article 511 through 516
Lesson 9	Hazardous Location Applications

Core Curriculum: Course Level and Credit Summary

Building Automation 1: Control Devices and Applications, Level I

Item Code: J238LM.H1

Core Curriculum Year: Advanced

Advanced Credits

1.5

Course Prerequisite(s): None

Other Prerequisites: 4000 Hours of OJT

Required Material(s):

- ***Building Automation: Control Devices (S518)***

Lesson 1	Introduction to Building Automation
Lesson 2	Electrical Systems
Lesson 3	Lighting Sources and Controls
Lesson 4	Lighting System Control Devices
Lesson 5	HVAC Systems
Lesson 6	HVAC System Applications
Lesson 7	Automated Building Operation and Applications

Core Curriculum: Course Level and Credit Summary

Building Automation 2: System Integration with Open Protocols, Level I B

Item Code: J239LM.I1B

Core Curriculum Year: Advanced

Advanced Credits

2.0

Course Prerequisite(s): Building Automation 1, Level I

Other Prerequisites: None

Required Material(s):

• ***Building Automation: System Integration (S519)***

Lesson 1	Building Automation Interoperability
Lesson 2	Control Concepts
Lesson 3	Communication Fundamentals
Lesson 4	Introduction to BACnet
Lesson 5	BACnet Transports and Interworking
Lesson 6	BACnet Objects and Services
Lesson 7	BACnet Alarming, Scheduling, and Trending
Lesson 8	BACnet Special Applications
Lesson 9	BACnet Installation, Configuration, and Troubleshooting

Core Curriculum: Course Level and Credit Summary

Orientation, Level III

Item Code: J200LM.I3

Core Curriculum Year: 4

Core Credits

Advanced Credits

1.0

Course Prerequisite(s): Orientation, Level II

Other Prerequisites: None

Required Material(s):

- Lesson 1 The National Electrical Benefit Fund (NEBF)
- Lesson 2 After Apprenticeship
- Lesson 3 Soon To Be A Journey-Level Worker
- Lesson 4 This is a National Program
- Lesson 5 Keys to Success-Motivation and Leadership
- Lesson 6 The National Labor Relations Board
- Lesson 7 The Economics of Unemployment
- Lesson 8 The Realities of Construction

Lighting Essentials, Level I - 2nd Ed.

Item Code: J259LM.K1

Core Curriculum Year: Advanced

Advanced Credits

1.5

Course Prerequisite(s): None

Other Prerequisites: 4000 Hours of OJT

Required Material(s):

- ***Lighting Design Basics Textbook (\$699)***

- Lesson 1 Basic Concepts in Lighting
- Lesson 2 The Science of Light
- Lesson 3 Qualities of Light Sources
- Lesson 4 Daylighting
- Lesson 5 Lamps
- Lesson 6 Luminaires
- Lesson 7 Lighting Controls
- Lesson 8 Quantity and Quality of Light

Core Curriculum: Course Level and Credit Summary

Lighting Essentials, Level II - 2nd Ed.

Item Code: J259LM.K2

Core Curriculum Year: Advanced

Advanced Credits

1.5

Course Prerequisite(s): Lighting Essentials, Level I - 2nd Ed.

Other Prerequisites: None

Required Material(s):

- *Lighting Design Basics Textbook (S699)*

Lesson 1	Basic Lighting Retrofit and Energy Codes
Lesson 2	Understanding Fluorescent and HID Lighting Terminology
Lesson 3	The ABCs of Electronic Fluorescent Ballasts
Lesson 4	The ABCs of High Intensity Discharge (HID) Ballasts I
Lesson 5	The ABCs of High Intensity Discharge (HID) Ballasts II
Lesson 6	Introduction to LED Lighting and Technology
Lesson 7	LED Lighting in Detail
Lesson 8	LED Lighting Applications

Lightning Protection, Level I

Item Code: J276LM.J1

Core Curriculum Year: Advanced

Advanced Credits

1.0

Course Prerequisite(s): Grounding and Bonding, Level I

Other Prerequisites: None

Required Material(s):

Lesson 1	Lightning Protection Systems Introduction
Lesson 2	Lightning Protection Systems - Ground Work
Lesson 3	Down Conductors and Bonding
Lesson 4	Rooftops
Lesson 5	Concealed and Structural Steel Systems
Lesson 6	Bonding Requirements and Potential Equalization
Lesson 7	Surge Protection Devices

Core Curriculum: Course Level and Credit Summary

Code, Standards, and Practices 5, Based on the 2020 NEC

Item Code: J235LM.L

Core Curriculum Year: 4

Core Credits

Advanced Credits

2.0

Course Prerequisite(s): Code, Standards, and Practices 4, Level I

Other Prerequisites: None

Required Material(s):

• *National Electrical Code - 2020 (S1050)*

• *Significant Changes to the NEC (S1053)*

Lesson 1 Installing Electrical Services

Lesson 2 Swimming Pools, Fountains, and Similar Installations

Lesson 3 Understanding Emergency and Standby Systems Installation Requirements

Lesson 4 Over 1,000-Volt Installations

Lesson 5 Remote-Control, Signaling, and Power-Limited Circuits

Lesson 6 2020 NEC Changes – Part I

Lesson 7 2020 NEC Changes – Part II

Digital Electronics, Level I

Item Code: J240LM.I1

Core Curriculum Year: Advanced

Advanced Credits

5.0

Course Prerequisite(s): DC Theory, Level I/IV

Other Prerequisites: None

Required Material(s):

Lesson 1 Introduction to Digital Electronics

Lesson 2 Introduction to Boolean Algebra

Lesson 3 AND Logic

Lesson 4 OR Logic

Lesson 5 BUFFER and INVERTER Amplifiers

Lesson 6 NAND and NOR Logic

Lesson 7 XOR and XNOR Logic

Lesson 8 Debouncing Circuits

Core Curriculum: Course Level and Credit Summary

Introduction to Programmable Logic Controllers

Item Code: **J162LM**

Core Curriculum Year: Advanced

Advanced Credits

4.5

Course Prerequisite(s): Motor Control, Level I

Other Prerequisites: None

Required Material(s):

- ***Intro to Programmable Logic Controllers Textbook (S531)***

Lesson 1	PLC and Electrical Safety
Lesson 2	Electrical Principles and PLCs
Lesson 3	Electrical Circuits and PLCs
Lesson 4	PLC Hardware
Lesson 5	PLC Programming Instructions
Lesson 6	Programming PLC Timers and Counters
Lesson 7	PLC and System Interfacing
Lesson 8	PLC Installations and Startup
Lesson 9	PLC and System Maintenance
Lesson 10	Troubleshooting Principles and Test Instruments
Lesson 11	Troubleshooting PLC Hardware
Lesson 12	Troubleshooting with PLC Software
Lesson 13	Analog Principles
Lesson 14	Analog Device Installation and PLC Programming

Core Curriculum: Course Level and Credit Summary

Instrumentation Introduction - Module 1

Item Code: J126LM

Core Curriculum Year: Advanced

Advanced Credits

2.0

Course Prerequisite(s): Blueprints, Level I; Electrical Safety-Related Work Practices, Level I; AC Theory

Other Prerequisites: None

Required Material(s):

Lesson 1	Math Pre-Test Assessment
Lesson 2	Math
Lesson 3	Science Pre-Test Assessment
Lesson 4	Science
Lesson 5	Electrical Theory Pre-Test Assessment
Lesson 6	Electrical Theory
Lesson 7	Meters and Measurements Pre-Test Assessment
Lesson 8	Meters and Measurements
Lesson 9	Instrumentation Vocabulary Pre-Test Assessment
Lesson 10	Instrumentation Vocabulary
Lesson 11	Process and Instrumentation Diagram Interpretation Pre-Test Assessment
Lesson 12	Process and Instrumentation Diagram Interpretation
Lesson 13	Final Exam

Core Curriculum: Course Level and Credit Summary

Instrumentation Introduction - Module 2: Basics

Item Code: J134LM

Core Curriculum Year: Advanced

Advanced Credits

5.0

Course Prerequisite(s): Blueprints, Level I; Electrical Safety-Related Work Practices, Level I; Motor Control, Level II; Transformers, Level I

Other Prerequisites: None

Required Material(s):

- ***Applied Science of Instrumentation Textbook (S600)***

Lesson 1	Review
Lesson 2	Introduction to Instrumentation
Lesson 3	Fundamentals of Process and Control Systems
Lesson 4	Instrumentation Symbols and Diagrams
Lesson 5	Calibration Procedure and Documentation
Lesson 6	Principles of Pressure
Lesson 7	Principles of Level
Lesson 8	Principles of Flow
Lesson 9	Principles of Temperature
Lesson 10	Principles of Smart Instrumentation and Communication
Lesson 11	Control Valves, Actuators, and Accessories
Lesson 12	Final Exam

Core Curriculum: Course Level and Credit Summary

Structured Cabling - 2nd Ed.

Item Code: J271LM.J1

Core Curriculum Year: Advanced

Advanced Credits

3.0

Course Prerequisite(s): AC Theory, Level II/III

Other Prerequisites: None

Required Material(s):

• *Structured Cabling Textbook (S681)*

• *National Electrical Code - 2020 (S1050)*

Lesson 1	The Need for Structured Cabling Systems
Lesson 2	Introduction to Structured Cabling Standards and Codes
Lesson 3	Structured Cabling Standards
Lesson 4	Cables and Connectors
Lesson 5	Structured Cabling System Performance
Lesson 6	Unshielded Twisted Pair Connecting Hardware
Lesson 7	Telecommunications Pathways and Spaces
Lesson 8	Telecommunications Cabling Administration
Lesson 9	Telecommunications Grounding and Bonding
Lesson 10	Configuring Structured Cabling Systems
Lesson 11	Residential Cabling Systems
Lesson 12	Certifying the UTP Cabling System

Core Curriculum: Course Level and Credit Summary

Intrusion Detection, Level I - 2nd Ed.

Item Code: **J146LM.A1**

Core Curriculum Year: Advanced

Advanced Credits

1.5

Course Prerequisite(s): DC Theory, Level I/IV

Other Prerequisites: None

Notifications:

This course replaces Intrusion Detection, Level I - 1st Ed.

Required Material(s):

Lesson 1	Terms and Definitions
Lesson 2	Introduction to Security Systems
Lesson 3	Specific Applications for Magnetic Contacts
Lesson 4	Motion Sensors
Lesson 5	Glassbreak Sensors
Lesson 6	Control Panels, Keypads, and Modules
Lesson 7	Security System Design

Health Care Facility Electrical Systems, Level I, Based on the 2021 NFPA

Item Code: **J260LM.L1**

Core Curriculum Year: Advanced

Advanced Credits

1.0

Course Prerequisite(s): Code and Practices 3, Level I

Other Prerequisites: None

Notifications:

Course coming soon. Test Generator Tests coming soon.

Required Material(s):

- ***Health Care Systems Textbook (S898)***

Lesson 1	Introduction
Lesson 2	Utility Power
Lesson 3	Distribution
Lesson 4	Patient Care Spaces

Core Curriculum: Course Level and Credit Summary

Electrical Code Calculations, Level II, Based on the 2020 NEC

Item Code: J227LM.L2

Core Curriculum Year: 4

Core Credits

Advanced Credits

1.0

Course Prerequisite(s): Electrical Code Calculations, Level I

Other Prerequisites: None

Required Material(s):

• *National Electrical Code - 2020 (S1050)*

• *Code Calculations Textbook - 2020 (S00820)*

Lesson 1 Calculating Voltage Drop in Feeders and Branch Circuits

Lesson 2 Introduction to Electrical Load Calculations

Lesson 3 Range and Appliance Calculations

Lesson 4 Calculating the Parameters of Residential Loads in Accordance with the *NEC*

Lesson 5 Calculating the Parameters of Multifamily Dwelling Loads in Accordance with the *NEC*

Lesson 6 Calculating the Parameters of Commercial Loads in Accordance with the *NEC*

Core Curriculum: Course Level and Credit Summary

Power Quality, Level I

Item Code: J228LM.I1

Core Curriculum Year: Advanced

Advanced Credits

2.0

Course Prerequisite(s): AC Theory, Level II/III; DC Theory, Level II/V

Other Prerequisites: None

Required Material(s):

- ***Power Quality Textbook (S569)***

Lesson 1	Why Care About Power Quality?
Lesson 2	The Basics of Power Quality
Lesson 3	Safety
Lesson 4	Using the Right Tool
Lesson 5	Monitor Setup
Lesson 6	Data Collection and Analysis
Lesson 7	Practical Examples
Lesson 8	“Rules of Thumb”
Lesson 9	Mitigation Equipment

Core Curriculum: Course Level and Credit Summary

Distributed Generation, Level I

Item Code: J229LM.I1

Core Curriculum Year: Advanced

Advanced Credits

0.5

Course Prerequisite(s): AC Theory, Level II/III


Other Prerequisites: None

Required Material(s):

Lesson 1	Information Technology Sites and Critical Loads
Lesson 2	UPS — Uninterruptible Power Supplies
Lesson 3	Infrastructure Components
Lesson 4	Critical UPS Systems Design Configurations
Lesson 5	UPS Installation
Lesson 6	Critical Systems Service
Lesson 7	Fuel Cell Basics and Applications
Lesson 8	Fuel Cell Installation

Core Curriculum: Course Level and Credit Summary

Photovoltaics, Level I

 Item Code: J230IG.J

Core Curriculum Year: Advanced

Advanced Credits

3.0

Course Prerequisite(s): AC Theory, Level II/III

Other Prerequisites: None

Required Material(s):

- *Photovoltaic Systems Textbook, 3rd Ed. (S674)*
- *National Electrical Code - 2011 (S650)*
- *OSHA Standards for the Construction Industry (S125)*

Lesson 1	Introduction to Photovoltaic Systems
Lesson 2	Fundamentals of Solar Radiation
Lesson 4	Solar Radiation Data and Measurements
Lesson 5	Site Surveys and Planning
Lesson 6	Photovoltaic Systems and Components
Lesson 7	Fundamentals of Photovoltaic Devices
Lesson 8	Photovoltaic Modules and Arrays
Lesson 11	Inverters
Lesson 14	Electrical Integration I
Lesson 16	Utility Interconnection