

Core Curriculum

Course Level and Credit Summary

Class of 2025



Core Curriculum: Credit Summary Per Year

1st Year	
Core	31.5
Advanced	2
Local Advanced	0
Application	2
Total	35.5

2nd Year	
Core	27.5
Advanced	0
Local Advanced	0
Application	2
Total	29.5

3rd Year	
Core	13
Advanced	10
Local Advanced	0
Application	0
Total	23

4th Year	
Core	12
Advanced	18.5
Local Advanced	0
Application	0
Total	30.5

5th Year	
Core	5.5
Advanced	10.5
Local Advanced	0
Application	0
Total	16

Grand Totals	
Total Core Credits	89.5
Total Advanced Credits	41
Total Local Advanced Credits	0
Total Application Credits	4
Total Credits	134.5

Core Curriculum: Course Selection Per Year

1st Year Core	
Orientation, Level I	2
Building a Foundation in Mathematics, Level I	0
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
Code, Standards, and Practices 1, Based on the 2020 NEC	4
Blueprints, Level I	2.5
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
Conduit Fabrication, Level II - 2nd Ed.	4
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
Electrical Safety-Related Work Practices, Level I, Based on the 2018 70E	2
Codeology, Based on the 2020 NEC	3
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
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
Blueprints, Level II	2
Electrical Code Calculations, Level I, Based on the 2020 NEC	1
Transformers, Level I - 2nd Ed.	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	
Fire Alarm Systems, Level I, Based on the 2020 NEC	2
Rigging, Hoisting, and Signaling, Level I	2
Preparing for Leadership: Personal Qualities, Level I	2
Code, Standards, and Practices 3, Based on the 2020 NEC	2
Electrical Safety-Related Work Practices, Level II, Based on the 2018 70E	2
Blueprints, Level III	1
Grounding and Bonding, Level I, Based on the 2020 NEC	2
Structured Cabling, Level I	3
Fiber Optics, Level I	1
Lightning Protection, Level I	1
Lighting Essentials, Level I - 2nd Ed.	1.5
Lighting Essentials, Level II - 2nd Ed.	1.5
Transformers, Level II, Based on the 2020 NEC - 2nd Ed.	2

Core Curriculum: Course Selection Per Year

4th Year Core	
Grounding and Bonding, Level II, Based on the 2020 NEC	2.5
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
Introduction to Network Technologies, Level I	2
Power Quality, Level I	2
Photovoltaics, Level I	3
Introduction to Programmable Logic Controllers	4.5
Telephony, Level I	2
Intrusion Detection, Level I - 2nd Ed.	1.5

5th Year Core	
Orientation, Level III	1
Torque, Level I	0.5
Fire Alarm Systems, Level II, Based on the 2020 NEC	2
Distributed Generation, Level I	0.5
Transformers, Level III - 2nd Ed.	1
Code, Standards, and Practices 4, Based on the 2020 NEC	1
Code, Standards, and Practices 5, Based on the 2020 NEC	2
Code, Standards, and Practices 6, Based on the 2020 NEC	1.5
Code, Standards, and Practices 7, Based on the 2020 NEC	1
Electrical Code Calculations, Level II, Based on the 2020 NEC	1
Electrical Code Calculations, Level III, Based on the 2020 NEC	0.5
Hazardous Locations, Based on the 2020 NEC	2
Health Care Facility Electrical Systems, Level I, Based on the NFPA 99 and 2017 NEC	1
Health Care Facility Electrical Systems, Level II, Based on the NFPA 99 and 2017 NEC	1

Core Curriculum: 1st Year Core Courses

	Credits	Page
Orientation, Level I		
J200LM.I1	2	2
Building a Foundation in Mathematics, Level I		
J201LM.I1	0	3
Job Information 1, Level I, Based on the 2020 NEC		
J221LM.N1	3	4
Conduit Fabrication, Level I - 2nd Ed.		
J204LM.H1	3	5
Job Information 1, Level II, Based on the 2020 NEC		
J221LM.N2	3	6
Code, Standards, and Practices 1, Based on the 2020 NEC		
J231LM.L	4	7
Blueprints, Level I		
J244LM.I1	2.5	8
DC Theory, Level I - 2nd Ed.		
J202LM.K1	3	9
DC Theory, Level II - 2nd Ed.		
J202LM.K2	3	10
DC Theory, Level III - 2nd Ed.		
J202LM.K3	2	10
DC Theory, Level IV - 2nd Ed.		
J202LM.K4	2	11
DC Theory, Level V - 2nd Ed.		
J202LM.K5	2	11
Conduit Fabrication, Level II - 2nd Ed.		
J204LM.H2	4	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
Electrical Industry Applications Manual, Lesson 3-Installing a Single Pole Switch		
≡ J300.K	0.25	1

Core Curriculum: 1st Year Core Courses cont.

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)*
- *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)*
- *Building a Foundation in Mathematics (S665)*
- *Conduit Lab Manual (J204L)*
- *Electrical Systems Textbook (S1070)*
- *National Electrical Code - 2017 (S950)*
- *Residential Blueprints (S135.H)*
- *TI-30X IIS Solar Calculator (S159)*

Core Curriculum: 2nd Year Core Courses

	Credits	Page
Orientation, Level II		
J200LM.I2	1.5	12
Electrical Safety-Related Work Practices, Level I, Based on the 2018 70E		
J444LM.L1	2	13
Codeology, Based on the 2020 NEC		
J207LM.L	3	13
Code, Standards, and Practices 2, Level I, Based on the 2020 NEC		
J232LM.L1	2	14
Code, Standards, and Practices 2, Level II, Based on the 2020 NEC		
J232LM.L2	2	14
AC Systems, Level I - 3rd Ed.		
J103LM.K1	2	15
AC Theory, Level I - 3rd Ed.		
J203LM.K1	3	15
AC Theory, Level II - 3rd Ed.		
J203LM.K2	4	16
AC Theory, Level III - 3rd Ed.		
J203LM.K3	3	17
Blueprints, Level II		
J244LM.I2	2	17
Electrical Code Calculations, Level I, Based on the 2020 NEC		
J227LM.L1	1	18
Transformers, Level I - 2nd Ed.		
J205LM.I1	2	18
Electrical Industry Applications Manual, Lesson 5-Proper Device Installation Techniques, GFCI Rough-In		
≡ J300.K	0.25	1
Electrical Industry Applications Manual, Lesson 6-Using Anchors to Install a Metal Enclosure		
≡ J300.K	0.25	1
Electrical Industry Applications Manual, Lesson 10-Erecting an Extension Ladder		
≡ J300.K	0.25	1
Electrical Industry Applications Manual, Lesson 13-Cutting a Hole in a Metal Enclosure for an EMT Connector		
≡ J300.K	0.25	1

Core Curriculum: 2nd Year Core Courses cont.

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)*
- *Codeology Textbook (S01720)*
- *Electrical Safety-Related Work Practices Textbook (S844)*
- *National Electrical Code - 2017 (S950)*
- *Test Instruments and Applications Textbook (S571)*
- *Blueprint Reading for Electricians Textbook (S648)*
- *Code Calculations Textbook - 2020 (S00820)*
- *Commercial Blueprints (S136.H)*
- *Electrical Systems Textbook (S1070)*
- *National Electrical Code - 2020 (S1050)*
- *Transformers Principles and Applications Textbook (S476)*

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>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
Fire Alarm Systems, Level I, Based on the 2020 NEC		
J211LM.L1	2	19
Rigging, Hoisting, and Signaling, Level I		
J241LM.J1	2	20
Preparing for Leadership: Personal Qualities, Level I		
J900LM	2	21
Code, Standards, and Practices 3, Based on the 2020 NEC		
J233LM.L	2	22
Electrical Safety-Related Work Practices, Level II, Based on the 2018 70E		
J444LM.L2	2	23
Blueprints, Level III		
J244LM.I3	1	23
Grounding and Bonding, Level I, Based on the 2020 NEC		
J210LM.L1	2	24
Structured Cabling, Level I		
J271LM.I1	3	25
Fiber Optics, Level I		
J277LM	1	26
Lightning Protection, Level I		
J276LM.J1	1	27
Lighting Essentials, Level I - 2nd Ed.		
J259LM.K1	1.5	27
Lighting Essentials, Level II - 2nd Ed.		
J259LM.K2	1.5	28
Transformers, Level II, Based on the 2020 NEC - 2nd Ed.		
J205LM.I2_20	2	28

Core Curriculum: 3rd Year Required Materials

Required Materials:

- *Blueprint Reading for Electricians Textbook (S648)*
- *Effective Leadership Skills Textbook (S097)*
- *Fire Alarm Textbook (S946)*
- *Industrial Blueprints (S137)*
- *National Electrical Code - 2014 (S750)*
- *Reference Guide to Fiber Optics (S480)*
- *Structured Cabling Textbook (S581)*
- *Transformers Principles and Applications Textbook (S476)*
- *Code Calculations Textbook - 2020 (S00820)*
- *Electrical Safety-Related Work Practices Textbook (S844)*
- *Grounding and Bonding Textbook (S36820)*
- *Lighting Design Basics Textbook (S699)*
- *National Electrical Code - 2020 (S1050)*
- *Rigging, Hoisting, Signaling Practices Textbook (S661)*
- *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>Code Calculations Textbook - 2020 (S00820)</i> | <i>Purchased, Year 2</i> |
| • <i>Electrical Safety-Related Work Practices Textbook (S844)</i> | <i>Purchased, Year 2</i> |
| • <i>National Electrical Code - 2014 (S750)</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> |
| • <i>Transformers Principles and Applications Textbook (S476)</i> | <i>Purchased, Year 2</i> |

Core Curriculum: 4th Year Core Courses

	Credits	Page
Grounding and Bonding, Level II, Based on the 2020 NEC		
J210LM.L2	2.5	29
Motors, Level I - 2nd Ed.		
J206LM.J1	0.5	30
Motors, Level II, Based on the 2020 NEC - 2nd Ed.		
J206LM.J2_20	1.5	31
Motors, Level III - 2nd Ed.		
J206LM.J3	2	32
Motor Control, Level I		
J209LM.H1	3.5	33
Motor Control, Level II		
J209LM.H2	4	34
Motor Control, Level III		
J209LM.H3	1.5	35
Introduction to Network Technologies, Level I		
J145LM.1	2	36
Power Quality, Level I		
J228LM.I1	2	37
Photovoltaics, Level I		
≡ J230IG.J	3	38
Introduction to Programmable Logic Controllers		
J162LM	4.5	39
Telephony, Level I		
T262LM	2	40
Intrusion Detection, Level I - 2nd Ed.		
J146LM.A1	1.5	41

Core Curriculum: 4th Year Required Materials

Required Materials:

- *Code Calculations Textbook - 2020 (S00820)*
- *Grounding and Bonding Textbook (S36820)*
- *Introduction to Network Technologies Textbook (S582)*
- *National Electrical Code - 2011 (S650)*
- *OSHA Standards for the Construction Industry (S125)*
- *Power Quality Textbook (S569)*
- *The Harris Handbook on Basic Telephony (S281)*
- *Fundamentals of Motor Control (S547)*
- *Intro to Programmable Logic Controllers Textbook (S531)*
- *Motors Textbook (S649)*
- *National Electrical Code - 2020 (S1050)*
- *Photovoltaic Systems Textbook, 3rd Ed. (S674)*
- *Test Instruments and Applications Textbook (S571)*

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

- | | |
|------------------------------------------------------------|--------------------------|
| • <i>Code Calculations Textbook - 2020 (S00820)</i> | <i>Purchased, Year 2</i> |
| • <i>Grounding and Bonding Textbook (S36820)</i> | <i>Purchased, Year 3</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: 5th Year Core Courses

	Credits	Page
Orientation, Level III		
J200LM.I3	1	41
Torque, Level I		
J242LM.1	0.5	42
Fire Alarm Systems, Level II, Based on the 2020 NEC		
J211LM.L2	2	42
Distributed Generation, Level I		
J229LM.I1	0.5	43
Transformers, Level III - 2nd Ed.		
J205LM.I3	1	43
Code, Standards, and Practices 4, Based on the 2020 NEC		
J234LM.L	1	44
Code, Standards, and Practices 5, Based on the 2020 NEC		
J235LM.L	2	44
Code, Standards, and Practices 6, Based on the 2020 NEC		
J236LM.L	1.5	45
Code, Standards, and Practices 7, Based on the 2020 NEC		
J237LM.L	1	46
Electrical Code Calculations, Level II, Based on the 2020 NEC		
J227LM.L2	1	46
Electrical Code Calculations, Level III, Based on the 2020 NEC		
J227LM.L3	0.5	47
Hazardous Locations, Based on the 2020 NEC		
J257LM.L	2	47
Health Care Facility Electrical Systems, Level I, Based on the NFPA 99 and 2017 NEC		
J260LM.K1	1	48
Health Care Facility Electrical Systems, Level II, Based on the NFPA 99 and 2017 NEC		
J260LM.K2	1	48

Core Curriculum: 5th Year Required Materials

Required Materials:

- *Code Calculations Textbook - 2020 (S00820)*
- *Fire Alarm Textbook (S946)*
- *National Electrical Code - 2020 (S1050)*
- *Transformers Principles and Applications Textbook (S476)*
- *Electrical Systems Textbook (S1070)*
- *Health Care Systems Textbook (S798)*
- *Significant Changes to the NEC (S1053)*

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

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|-------------------------------------------------------------------|--------------------------|
| • <i>Code Calculations Textbook - 2020 (S00820)</i> | <i>Purchased, Year 2</i> |
| • <i>Electrical Systems Textbook (S1070)</i> | <i>Purchased, Year 1</i> |
| • <i>Fire Alarm Textbook (S946)</i> | <i>Purchased, Year 3</i> |
| • <i>National Electrical Code - 2020 (S1050)</i> | <i>Purchased, Year 1</i> |
| • <i>Transformers Principles and Applications Textbook (S476)</i> | <i>Purchased, Year 2</i> |

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

Building a Foundation in Mathematics, Level I

Item Code: J201LM.I1

Core Curriculum Year: Advanced

Advanced Credits

0.0

Course Prerequisite(s): None

Other Prerequisites: None

Required Material(s):

- ***Building a Foundation in Mathematics (S665)***

Lesson 1	Whole Numbers
Lesson 2	Fractions
Lesson 3	Decimals
Lesson 4	Integers
Lesson 5	Rational Numbers
Lesson 6	Exponents
Lesson 7	Units and Measurements
Lesson 8	Algebra Essentials
Lesson 9	Equations, Formulas, and Inequalities
Lesson 10	Ratios, Rates, and Proportions
Lesson 11	Percents

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

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

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

Conduit Fabrication, Level II - 2nd Ed.

Item Code: J204LM.H2

Core Curriculum Year: 1

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

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

Electrical Safety-Related Work Practices, Level I, Based on the 2018 70E

Item Code: J444LM.L1

Core Curriculum Year: 2

Core Credits

Advanced Credits

2.0

Course Prerequisite(s): None

Other Prerequisites: None

Required Material(s):

- *Electrical Safety-Related Work Practices Textbook (S844)*

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

Codeology, Based on the 2020 NEC

Item Code: J207LM.L

Core Curriculum Year: 2

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

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

Item Code: J232LM.L1

Core Curriculum Year: 2

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

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

Item Code: J232LM.L2

Core Curriculum Year: 2

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

Core Curriculum: Course Level and Credit Summary

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

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

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

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

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

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

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

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

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

Item Code: J233LM.L

Core Curriculum Year: 3

Core Credits

Advanced Credits

2.0

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

Core Curriculum: Course Level and Credit Summary

Electrical Safety-Related Work Practices, Level II, Based on the 2018 70E

Item Code: J444LM.L2

Core Curriculum Year: 3

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 (S844)*

- Lesson 1 Introduction to *NFPA 70E*[®]
- Lesson 2 Justification, Assessment, and Implementation of Energized Work
- 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

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

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

Structured Cabling, Level I

Item Code: J271LM.I1

Core Curriculum Year: Advanced

Advanced Credits

3.0

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

Other Prerequisites: None

Notifications:

The S471 edition of the Test Instruments Textbook can be used for this course if it is already owned by

Required Material(s):

- *Structured Cabling Textbook (S581)*
- *National Electrical Code - 2014 (S750)*
- *Test Instruments and Applications Textbook (S571)*

Lesson 1	The Need for Structured Cabling Systems
Lesson 2	Introduction to TIA/EIA Standards and Codes
Lesson 3	Structured Cabling System Overview
Lesson 4	Safety Codes
Lesson 5	Cabling System Performance
Lesson 6	Unshielded Twisted Pair Cables
Lesson 7	Unshielded Twisted Pair Connected Hardware
Lesson 8	Telecommunications Pathways and Spaces
Lesson 9	Telecommunications Cabling Administration
Lesson 10	Telecommunications Grounding and Bonding
Lesson 11	Configuring Structured Cabling Systems
Lesson 12	Structured Cabling Systems Application
Lesson 13	Residential Telecommunications Cabling
Lesson 14	Certifying the UTP Cabling System

Core Curriculum: Course Level and Credit Summary

Fiber Optics, Level I

Item Code: J277LM

Core Curriculum Year: Advanced

Advanced Credits

1.0

Course Prerequisite(s): Structured Cabling, Level I

Other Prerequisites: None

Notifications:

The S471 edition of the Test Instruments Textbook can be used for this course if it is already owned by

Required Material(s):

• *Reference Guide to Fiber Optics (S480)*

• *Test Instruments and Applications Textbook (S571)*

Lesson 1	Introduction to Fiber Optics
Lesson 2	Understanding Fiber-Optic Terminology
Lesson 3	Fiber-Optic Communications
Lesson 4	Fiber-Optic Transmission Systems and Components
Lesson 5	Optical Fiber
Lesson 6	Fiber-Optic Cable
Lesson 7	Connectors and Splices
Lesson 8	Fiber-Optic Testing
Lesson 9	Fiber-Optic Network Design
Lesson 10	Fiber-Optic Network Installation

Core Curriculum: Course Level and Credit Summary

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

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 (S699)*

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

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

Item Code: J205LM.I2_20

Core Curriculum Year: 3

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

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

Item Code: J210LM.L2

Core Curriculum Year: 4

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

Motors, Level I - 2nd Ed.

Item Code: J206LM.J1

Core Curriculum Year: 4

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: 4

Core Credits

Advanced Credits

1.5

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

Other Prerequisites: None

Required Material(s):

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

- 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: 4

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: 4

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

Core Curriculum: Course Level and Credit Summary

Introduction to Network Technologies, Level I

Item Code: J145LM.1

Core Curriculum Year: Advanced

Advanced Credits

2.0

Course Prerequisite(s): Structured Cabling, Level I

Other Prerequisites: None

Required Material(s):

- ***Introduction to Network Technologies Textbook (S582)***

Lesson 1	Introduction to Networking
Lesson 2	Overview of Networking Components
Lesson 3	Understanding the OSI Model
Lesson 4	Ethernet
Lesson 5	Understanding Wireless Networking
Lesson 6	IPv4
Lesson 7	IPv6
Lesson 8	Networking Protocols

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

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

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

Telephony, Level I

Item Code: T262LM

Core Curriculum Year: Advanced

Advanced Credits

2.0

Course Prerequisite(s): None

Other Prerequisites: None

Required Material(s):

- ***The Harris Handbook on Basic Telephony (S281)***

Lesson 1	Telephone Definitions
Lesson 2	Understanding a Telephone System
Lesson 3	Introduction to Telephone Circuitry
Lesson 4	Basic Telephone Wiring
Lesson 5	Analog Signals vs Digital Signals
Lesson 6	Electronic Key Systems Overview
Lesson 7	Electronic Key Systems Applications
Lesson 8	Electronic Key Systems Components
Lesson 9	Electronic Key Systems Installation
Lesson 10	PBX Telephone Systems
Lesson 11	PBX System Components
Lesson 12	PBX System Installation Requirements
Lesson 13	EKS/PBX Troubleshooting Practices

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

Orientation, Level III

Item Code: **J200LM.I3**

Core Curriculum Year: 5

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

Core Curriculum: Course Level and Credit Summary

Torque, Level I

Item Code: J242LM.1

Core Curriculum Year: 5

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

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

Item Code: J211LM.L2

Core Curriculum Year: Advanced

Advanced Credits

2.0

Course Prerequisite(s): Fire Alarm Systems, Level I

Other Prerequisites: None

Required Material(s):

- *Fire Alarm Textbook (S946)*

- Lesson 1 Advanced Detection Topics
- Lesson 2 Public Emergency Alarm Reporting Systems and Supervising Stations
- Lesson 3 Single- and Multiple-Station Alarms and Household Fire Alarm Systems
- Lesson 4 Inspection, Testing, and Maintenance

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

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

Core Curriculum: Course Level and Credit Summary

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

Item Code: J234LM.L

Core Curriculum Year: 5

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

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

Item Code: J235LM.L

Core Curriculum Year: 5

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

Core Curriculum: Course Level and Credit Summary

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 – NEC 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

Code, Standards, and Practices 7, Based on the 2020 NEC

Item Code: J237LM.L

Core Curriculum Year: Advanced

Advanced Credits

1.0

Course Prerequisite(s): Code, Standards, and Practices 5, Level I

Other Prerequisites: None

Notifications:

Expected use is as a 5th year Advanced course in 2021-2022.

Required Material(s):

- ***National Electrical Code - 2020 (S1050)***

Lesson 1	Installing Wire Mesh Cable Tray (WMCT)
Lesson 2	Installing Surface Nonmetallic Raceways
Lesson 3	Infloor Installations
Lesson 4	Installing Multioutlet Assemblies
Lesson 5	NEC for Solar Photovoltaic (PV) Systems

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

Item Code: J227LM.L2

Core Curriculum Year: 5

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

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

Item Code: J227LM.L3

Core Curriculum Year: Advanced

Advanced Credits

0.5

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

Other Prerequisites: None

Notifications:

Expected use is as a 5th year Advanced course in 2021-2022.

Required Material(s):

• *National Electrical Code - 2020 (S1050)*

• *Code Calculations Textbook - 2020 (S00820)*

Lesson 1 Cable Tray Fills

Lesson 2 Ampacity of Conductors in Cable Trays

Lesson 3 Electric Welders

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

Notifications:

Course coming soon. Test Generator Tests coming soon.

Required Material(s):

Core Curriculum: Course Level and Credit Summary

Health Care Facility Electrical Systems, Level I, Based on the NFPA 99

Item Code: J260LM.K1

Core Curriculum Year: Advanced

Advanced Credits

1.0

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

Other Prerequisites: None

Required Material(s):

- *Health Care Systems Textbook (S798)*

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

Health Care Facility Electrical Systems, Level II, Based on the NFPA 99

Item Code: J260LM.K2

Core Curriculum Year: Advanced

Advanced Credits

1.0

Course Prerequisite(s): Health Care Facility Electrical Systems, Level I

Other Prerequisites: None

Required Material(s):

- *Health Care Systems Textbook (S798)*

Lesson 1	Facility Electrical Equipment Maintenance
Lesson 2	Work in Existing Health Care Facilities
Lesson 3	The Future of Health Care