

Core Curriculum

2nd Year Syllabus

Class of 2024



Core Curriculum: Course Selection Per Year

2nd Year Core	
Orientation, Level II	1.5
Electrical Safety-Related Work Practices, Level I, Based on the 2018 70E	2
Codeology, Level I, Based on the 2017 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

Core Curriculum: 2nd Year Core Courses

	Credits	Page	Date
Orientation, Level II			
J200LM.I2	1.5	1	
Electrical Safety-Related Work Practices, Level I, Based on the 2018 70E			
J444LM.L1	2.0	2	
Codeology, Level I, Based on the 2017 NEC			
J207LM.K1	3.0	2	
Code, Standards, and Practices 2, Level I, Based on the 2020 NEC			
J232LM.L1	2.0	3	
Code, Standards, and Practices 2, Level II, Based on the 2020 NEC			
J232LM.L2	2.0	4	
AC Systems, Level I - 3rd Ed.			
J103LM.K1	2.0	4	
AC Theory, Level I - 3rd Ed.			
J203LM.K1	3.0	5	
AC Theory, Level II - 3rd Ed.			
J203LM.K2	4.0	5	
AC Theory, Level III - 3rd Ed.			
J203LM.K3	3.0	6	
Blueprints, Level II			
J244LM.I2	2.0	7	
Electrical Code Calculations, Level I, Based on the 2020 NEC			
J227LM.L1	1.0	7	

Core Curriculum: 2nd Year Core Courses

	Credits	Page	Date
Transformers, Level I - 2nd Ed.			
J205LM.I1	2.0	8	
Electrical Industry Applications Manual, Lesson 5 - Proper Device Installation			
≡ J300.K	0.25	8	
Electrical Industry Applications Manual, Lesson 6 - Using Anchors to Install a Metal			
≡ J300.K	0.25	8	
Electrical Industry Applications Manual, Lesson 10 - Erecting an Extension Ladder			
≡ J300.K	0.25	8	
Electrical Industry Applications Manual, Lesson 13 - Cutting a Hole in a Metal Enclosure			
≡ J300.K	0.25	8	
Electrical Industry Applications Manual, Lesson 15 - Threading Conduit (Tapered			
≡ J300.K	0.25	8	
Electrical Industry Applications Manual, Lesson 16 - Installing Flexible Metallic Conduit			
≡ J300.K	0.25	8	
Electrical Industry Applications Manual, Lesson 17 - Installing Armor Clad and Metal			
≡ J300.K	0.25	8	
Electrical Industry Applications Manual, Lesson 20 - Wire Pulling Techniques			
≡ J300.K	0.25	8	

Core Curriculum: Course Level and Credit Summary

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

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

Core Curriculum: Course Level and Credit Summary

Codeology, Level I, Based on the 2017 NEC

Item Code: J207LM.K1

Core Curriculum Year: 2

Core Credits

Advanced Credits

3.0

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

Other Prerequisites: None

Required Material(s):

• *Codeology Textbook (S01717)*

• *National Electrical Code - 2017 (S950)*

- Lesson 1 Developing *NEC* Skills
- Lesson 2 The *National Electrical Code* Process
- Lesson 3 The Arrangement of the *NEC*
- Lesson 4 The Structure of the *NEC*
- Lesson 5 The Language of the *NEC*
- Lesson 6 *Codeology* Fundamentals
- Lesson 7 Article 90 Introduction
- Lesson 8 Applying the *NEC*'s "GENERAL" Chapter
- Lesson 9 Applying the *NEC*'s "PLAN" Chapter
- Lesson 10 Applying the *NEC*'s "BUILD" Chapter
- Lesson 11 Applying the *NEC*'s "USE" Chapter
- Lesson 12 Applying the *NEC*'s "SPECIAL" Chapters
- Lesson 13 Applying Chapter 8, Chapter 9 Tables, and *NEC* Exam Preparation Skills

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

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.