

Core Curriculum

2nd Year Syllabus

7.1.22 2022-2023



Core Curriculum: Course Selection Per Year

2nd Year Core	
Constructing Your Future	0.5
IBEW Orientation	1
Applied Codeology, Navigating the 2020 NEC	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
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 Code Calculations, Level I, Based on the 2020 NEC	1
Transformers, Level I - 2nd Ed.	2
Construction Drawings	3.5
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
Constructing Your Future			
J200LM.J1	0.5	1	
IBEW Orientation			
J200LM.J3	1.0	2	
Applied Codeology, Navigating the 2020 NEC			
J207LM.M	4.0	2	
AC Systems, Level I - 3rd Ed.			
J103LM.K1	2.0	3	
AC Theory, Level I - 3rd Ed.			
J203LM.K1	3.0	4	
AC Theory, Level II - 3rd Ed.			
J203LM.K2	4.0	4	
AC Theory, Level III - 3rd Ed.			
J203LM.K3	3.0	5	
Code, Standards, and Practices 2, Level I, Based on the 2020 NEC			
J232LM.L1	2.0	6	
Code, Standards, and Practices 2, Level II, Based on the 2020 NEC			
J232LM.L2	2.0	6	
Electrical Code Calculations, Level I, Based on the 2020 NEC			
J227LM.L1	1.0	7	
Transformers, Level I - 2nd Ed.			
J205LM.I1	2.0	7	

Core Curriculum: 2nd Year Core Courses

	Credits	Page	Date
Construction Drawings			
J244LM.J1	3.5	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

Constructing Your Future

Item Code: J200LM.J1

Core Curriculum Year: 2

Core Credits

Advanced Credits

0.5

Course Prerequisite(s): None

Other Prerequisites: None

Required Material(s):

- Lesson 1 What to Expect
- Lesson 2 Opportunities Abound
- Lesson 3 Personal Responsibilities & Expectations
- Lesson 4 Safety Never Takes a Break
- Lesson 5 What it Takes to Succeed

IBEW Orientation

Item Code: J200LM.J3

Core Curriculum Year: 2

Core Credits

Advanced Credits

1.0

Course Prerequisite(s): Introduction to Apprenticeship

Other Prerequisites: None

Required Material(s):

- Lesson 1 Becoming Familiar with the IBEW Constitution
- Lesson 2 Understanding Your Local Union By-Laws
- Lesson 3 Parliamentary Procedure and How It Works
- Lesson 4 An Introduction to The COMET Program

Core Curriculum: Course Level and Credit Summary

Applied Codeology, Navigating the 2020 NEC

Item Code: J207LM.M

Core Curriculum Year: 2

Core Credits

Advanced Credits

4.0

Course Prerequisite(s): Electrical Job Information 1

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 Planning the Installation
- Lesson 3 Building the Installation
- Lesson 4 Using the Electricity
- Lesson 5 Special Occupancies
- Lesson 6 Special Equipment
- Lesson 7 Special Conditions
- Lesson 8 Communications
- Lesson 9 Tables and the Informative Annexes
- Lesson 10 The Codeology Method
- Lesson 11 Post-Course Assessment

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

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

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: 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

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

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

Construction Drawings

Item Code: J244LM.J1

Core Curriculum Year: 2

Core Credits

Advanced Credits

3.5

Course Prerequisite(s): None

Other Prerequisites: None

Required Material(s):

- *Construction Drawings Textbook (S748)*
- *electrical training ALLIANCE Architectural Scale (S187)*
- *Commercial Blueprints (S136.H)*
- *Student Notebook (N202)*

- Lesson 1 Introduction to Blueprints and the Design Process
- Lesson 2 Scaling and Dimensions
- Lesson 3 Plan Views
- Lesson 4 Elevations
- Lesson 5 Details and Sections
- Lesson 6 Schedules and Specifications

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.