

Core Curriculum

1st Year Syllabus

2019/2020 Roadmap



Core Curriculum: Course Selection Per Year

1st Year Core	
Orientation, Level I	2
Job Information 1, Level I, Based on the 2017 NEC	3
Conduit Fabrication, Level I - 2nd Ed.	3
Job Information 1, Level II, Based on the 2017 NEC	3
Code, Standards, and Practices 1, Level I, Based on the 2017 NEC	4
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
Blueprints, Level I	2.5
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
Welding Skills, Level I	0
Welding Skills, Level II	0

Core Curriculum: 1st Year Core Courses

	Credits	Page	Date
Orientation, Level I			
J200LM.I1	2.0	1	
Job Information 1, Level I, Based on the 2017 NEC			
J221LM.M1	3.0	2	
Conduit Fabrication, Level I - 2nd Ed.			
J204LM.H1	3.0	3	
Job Information 1, Level II, Based on the 2017 NEC			
J221LM.M2	3.0	4	
Code, Standards, and Practices 1, Level I, Based on the 2017 NEC			
J231LM.K1	4.0	5	
DC Theory, Level I - 2nd Ed.			
J202LM.K1	3.0	6	
DC Theory, Level II - 2nd Ed.			
J202LM.K2	3.0	7	
DC Theory, Level III - 2nd Ed.			
J202LM.K3	2.0	8	
DC Theory, Level IV - 2nd Ed.			
J202LM.K4	2.0	8	
DC Theory, Level V - 2nd Ed.			
J202LM.K5	2.0	9	
Blueprints, Level I			
J244LM.I1	2.5	9	

Core Curriculum: 1st Year Core Courses

	Credits	Page	Date
Electrical Industry Applications Manual, Lesson 1 - Splicing Conductors			
≡ J300.K	0.25	13	
Electrical Industry Applications Manual, Lesson 2 - Installing a Duplex Receptacle			
≡ J300.K	0.25	13	
Electrical Industry Applications Manual, Lesson 3 - Installing a Single Pole Switch			
≡ J300.K	0.25	13	
Electrical Industry Applications Manual, Lesson 4 - Installing a Switched Duplex			
≡ J300.K	0.25	13	
Electrical Industry Applications Manual, Lesson 8 - Using a Hacksaw			
≡ J300.K	0.25	13	
Electrical Industry Applications Manual, Lesson 9 - Lifting and Carrying Conduit			
≡ J300.K	0.25	13	
Electrical Industry Applications Manual, Lesson 11 - Hand Bending a 90° Stub-up			
≡ J300.K	0.25	13	
Electrical Industry Applications Manual, Lesson 12 - Hand Bending a Box Offset			
≡ J300.K	0.25	13	
Welding Skills, Level I			
J133LM.P1	0.0	10	
Welding Skills, Level II			
J133LM.P2	0.0	12	

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 2017 NEC

Item Code: J221LM.M1

Core Curriculum Year: 1

Core Credits

Advanced Credits

3.0

Course Prerequisite(s): None

Other Prerequisites: None

Required Material(s):

• ***National Electrical Code - 2017 (\$950)***

• ***DC Theory Textbook (\$640)***

• ***Electrical Systems Textbook (\$970)***

- 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 - 2011 (S650)*

- 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 2017 NEC

Item Code: J221LM.M2

Core Curriculum Year: 1

Core Credits

Advanced Credits

3.0

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

Other Prerequisites: None

Notifications:

This course is the same as Job Information 2, Level I. Only the course title changed.

Required Material(s):

- *DC Theory Textbook (S640)*
- *National Electrical Code - 2017 (S950)*
- *Building a Foundation in Mathematics (S665)*
- *Electrical Systems Textbook (S970)*

- 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, Level I, Based on the 2017 NEC

Item Code: J231LM.K1

Core Curriculum Year: 1

Core Credits

Advanced Credits

4.0

Course Prerequisite(s): None

Other Prerequisites: None

Required Material(s):

• *National Electrical Code - 2017 (S950)*

• *Electrical Systems Textbook (S970)*

- 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

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 - 2014 (S750)*

- 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

Core Credits

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

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)***

- 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

Welding Skills, Level I

Item Code: **J133LM.P1**

Core Curriculum Year: Advanced

Core Credits

Advanced Credits

0.0

Course Prerequisite(s): None

Other Prerequisites: None

Required Material(s):

• *Printreading for Welders Textbook (S101)*

• *Welding Skills Textbook (S102)*

Lesson 1	Welding Symbols
Lesson 2	Joint Design
Lesson 3	Fasteners and Structural Steel
Lesson 4	Fillet Welds
Lesson 5	Groove Welds
Lesson 6	Back, Backing, and Melt-Through Welds
Lesson 7	Plug and Slot Welds
Lesson 8	Surfacing Welds
Lesson 9	Edge Welds
Lesson 10	Spot, Seam, and Stud Welds
Lesson 11	Pipe Welding
Lesson 12	Nondestructive Examination Symbols
Lesson 13	An Essential Skill
Lesson 14	Welding Safety
Lesson 15	Joint Design and Welding Terms
Lesson 16	OAW–Equipment
Lesson 17	OAW–Setup and Operation
Lesson 18	OAW–Flat Position
Lesson 19	OAW–Other Positions
Lesson 20	SMAW–Equipment
Lesson 21	SMAW–Selecting Electrodes
Lesson 22	SMAW–Striking an Arc
Lesson 23	SMAW–Depositing a Continuous Bead
Lesson 24	SMAW–Flat Position
Lesson 25	SMAW–Horizontal Position
Lesson 26	SMAW–Vertical Position
Lesson 27	SMAW–Overhead Position
Lesson 28	GTAW–Equipment
Lesson 29	GTAW–Procedures
Lesson 30	GTAW–Applications

Core Curriculum: Course Level and Credit Summary

Welding Skills, Level I

Item Code: **J133LM.P1**

Core Curriculum Year: Advanced

Core Credits

Advanced Credits

0.0

Lesson 32 GMAW–Procedures

Lesson 33 GMAW–Applications

Lesson 34 Flux Cored Arc Welding (FCAW)

Core Curriculum: Course Level and Credit Summary

Welding Skills, Level II

Item Code: J133LM.P2

Core Curriculum Year: Advanced

Core Credits

Advanced Credits

0.0

Course Prerequisite(s): Welding Skills, Level I

Other Prerequisites: None

Required Material(s):

- *Welding Skills Textbook (S102)*

Lesson 1	Destructive Testing
Lesson 2	Nondestructive Examination
Lesson 3	Metallography
Lesson 4	Weld Discontinuities and Failures
Lesson 5	Welding Procedure Qualification
Lesson 6	Welder Performance Qualification
Lesson 7	Welding Metallurgy
Lesson 8	Metal Identification
Lesson 9	Weldability of Carbon and Alloy Steels
Lesson 10	Weldability of Tool Steels and Cast Irons
Lesson 11	Weldability of Stainless Steels
Lesson 12	Weldability of Nonferrous Metals
Lesson 13	Dissimilar Metal Welding
Lesson 14	Distortion Control
Lesson 15	Welding Symbols
Lesson 16	Materials and Fabrication Standards and Codes

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.