Core Curriculum

2nd Year Syllabus

2021-2022 OREJATC

electrical training ALLIANCE
IBEW - NECA

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Core Curriculum: Course Selection Per Year

2nd Year Core	
Orientation, Level II	1.5
Codeology, Based on the 2020 NEC	3
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
Blueprints, Level II	2
Electrical Industry Applications Manual, Lesson 5 - Proper Device Installation Techniques, GFCI Rough-In	0.25
Electrical Industry Applications Manual, Lesson 6 - Using Anchors to Install a Metal Enclosure	0.25
Electrical Industry Applications Manual, Lesson 10 - Erecting an Extension Ladder	0.25
Electrical Industry Applications Manual, Lesson 13 - Cutting a Hole in a Metal Enclosure for an EMT Connector	0.25
Electrical Industry Applications Manual, Lesson 15 - Threading Conduit (Tapered Thread)	0.25
Electrical Industry Applications Manual, Lesson 16 - Installing Flexible Metallic Conduit	0.25
Electrical Industry Applications Manual, Lesson 17 - Installing Armor Clad and Metal Clad Cables	0.25
Electrical Industry Applications Manual, Lesson 20 - Wire Pulling Techniques	0.25

Core Curriculum: 2nd Year Core Courses

Notes:

	Credits	Page	Date
Orientation, Level II			
J200LM.I2	1.5	1	
Codeology, Based on the 2020 NEC			
J207LM.L	3.0	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	
Blueprints, Level II			
J244LM.I2	2.0	8	

Core Curriculum: 2nd Year Core Courses

Notes:

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

Core Curriculum: Course Level and Credit Summary

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

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: 3.0 | Advanced Credits

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: 2.0 | Advanced Credits

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: 2.0 | Advanced Credits

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

Blueprints, Level II

Item Code: J244LM.I2

Core Curriculum Year: 2 | Core Credits: 2.0 | Advanced Credits

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

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.