

Core Curriculum

4th Year Syllabus

None



Core Curriculum: Course Selection Per Year

4th Year Core	
Lightning Protection, Level I	1
Code, Standards, and Practices 4, Based on the 2023 NEC	1
Motors, Level I - 2nd Ed.	0.5
Motors, Level II, Based on the 2023 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
Digital Electronics, Level I	5
Introduction to Programmable Logic Controllers - 2nd Ed.	4.5
Hazardous Locations, Based on the 2023 NEC	2
Health Care Facility Electrical Systems, Level I, Based on the 2021 NFPA 99 and 2020 NEC	1

Core Curriculum: 4th Year Core Courses

	Credits	Page	Date
Lightning Protection, Level I			
J276LM.J1	1.0	1	
Code, Standards, and Practices 4, Based on the 2023 NEC			
J234LM.M	1.0	2	
Motors, Level I - 2nd Ed.			
J206LM.J1	0.5	2	
Motors, Level II, Based on the 2023 NEC - 2nd Ed.			
J206LM.J2_23	1.5	3	
Motors, Level III - 2nd Ed.			
J206LM.J3	2.0	4	
Motor Control, Level I			
J209LM.H1	3.5	5	
Motor Control, Level II			
J209LM.H2	4.0	6	
Motor Control, Level III			
J209LM.H3	1.5	7	
Digital Electronics, Level I			
J240LM.I1	5.0	8	
Introduction to Programmable Logic Controllers - 2nd Ed.			
J162LM.A	4.5	9	
Hazardous Locations, Based on the 2023 NEC			
J257LM.M	2.0	10	

Core Curriculum: 4th Year Core Courses

	Credits	Page	Date
Health Care Facility Electrical Systems, Level I, Based on the 2021 NFPA 99 and 2020			
J260LM.L1	1.0	10	

Core Curriculum: Course Level and Credit Summary

Lightning Protection, Level I

Item Code: J276LM.J1

Core Curriculum Year: Advanced

Core Credits

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 |

Code, Standards, and Practices 4, Based on the 2023 NEC

Item Code: J234LM.M

Core Curriculum Year: 4

Core Credits

Advanced Credits

1.0

Course Prerequisite(s): Code, Standards, and Practices 3

Other Prerequisites: None

Required Material(s):

- | | |
|---|---------------------------------------|
| • National Electrical Code - 2023 (S1150) | • Electrical Systems Textbook (S1170) |
|---|---------------------------------------|

- | | |
|----------|------------------------------------|
| 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 |

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 2023 NEC - 2nd Ed.

Item Code: J206LM.J2_23

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)***
- ***National Electrical Code - 2023 (S1150)***
- ***Code Calculations Textbook - 2023 (S00823)***

- 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

Core Credits

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

Core Credits

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

Digital Electronics, Level I

Item Code: **J240LM.I1**

Core Curriculum Year: Advanced

Core Credits

Advanced Credits

5.0

Course Prerequisite(s): DC Theory, Level I/IV

Other Prerequisites: None

Required Material(s):

- | | |
|----------|-------------------------------------|
| Lesson 1 | Introduction to Digital Electronics |
| Lesson 2 | Introduction to Boolean Algebra |
| Lesson 3 | AND Logic |
| Lesson 4 | OR Logic |
| Lesson 5 | BUFFER and INVERTER Amplifiers |
| Lesson 6 | NAND and NOR Logic |
| Lesson 7 | XOR and XNOR Logic |
| Lesson 8 | Debouncing Circuits |

Core Curriculum: Course Level and Credit Summary

Introduction to Programmable Logic Controllers - 2nd Ed.

Item Code: J162LM.A

Core Curriculum Year: Advanced

Core Credits

Advanced Credits

4.5

Course Prerequisite(s): Motor Control, Level I

Other Prerequisites: None

Required Material(s):

- ***Programmable Logic Controllers Textbook (S631)***

Lesson 1	Programmable Logic Controllers and Critical Safety Practices
Lesson 2	PLC Electrical Principles, Ratings, and Circuit Calculations
Lesson 3	PLC Programming Symbols, Diagrams, and Logic Functions
Lesson 4	PLC Hardware, Memory, and Operating Cycle
Lesson 5	PLC Systems, Circuits, and Interface Devices
Lesson 6	PLC Programming Diagrams, Addresses, and Bit Instructions
Lesson 7	PLC Programming Timer and Counter Instructions
Lesson 8	PLC Analog Device Installation, Programming, and Troubleshooting
Lesson 9	PLC Installations and Startup
Lesson 10	Troubleshooting Methods and Test Instrument Operation
Lesson 11	Testing and Troubleshooting Electrical Devices and PLC Hardware
Lesson 12	Troubleshooting with PLC Software
Lesson 13	PLC System Maintenance

Hazardous Locations, Based on the 2023 NEC

Item Code: J257LM.M

Core Curriculum Year: Advanced

Core Credits

Advanced Credits

2.0

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

Other Prerequisites: None

Notifications:

Course coming soon.

Required Material(s):

Core Curriculum: Course Level and Credit Summary

Health Care Facility Electrical Systems, Level I, Based on the 2021 NFPA

Item Code: J260LM.L1

Core Curriculum Year: Advanced

Core Credits

Advanced Credits

1.0

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

Other Prerequisites: None

Required Material(s):

- ***Health Care Systems Textbook (S898)***

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