

Core Curriculum

4th Session Syllabus

2025-2026 except 2nd year



Core Curriculum: Course Selection Per Session

4th Session Core	
Torque for the Electrical Industry - CML	1
Code, Standards, and Practices 4, Based on the 2023 NEC - CML	1.5
Code, Standards, and Practices 5, Based on the 2023 NEC - CML	2
Motor Code Calculations, Based on the 2023 NEC - CML	1
Motors for Electricians - CML	4
Motor Control for Electricians - CML	7
Load and Service Calculations, Based on the 2023 NEC - CML	3
Building Automation 1: Control Devices and Applications, Level I	1.5
Photovoltaics, Level I	3
Structured Cabling Systems and Power-Limited Technologies - CML	4
Introduction to Programmable Logic Controllers - 2nd Ed.	4.5

Core Curriculum: 4th Session Core Courses

	Credits	Page	Date
Torque for the Electrical Industry - CML			
J242LM.A	1.0	1	
Code, Standards, and Practices 4, Based on the 2023 NEC - CML			
J234LM.N	1.5	2	
Code, Standards, and Practices 5, Based on the 2023 NEC - CML			
J235LM.N	2.0	2	
Motor Code Calculations, Based on the 2023 NEC - CML			
J227LM.N5	1.0	3	
Motors for Electricians - CML			
J206LM.K1	4.0	3	
Motor Control for Electricians - CML			
J209LM.I1	7.0	4	
Load and Service Calculations, Based on the 2023 NEC - CML			
J227LM.N2	3.0	5	
Building Automation 1: Control Devices and Applications, Level I			
J238LM.H1	1.5	6	
Photovoltaics, Level I			
≡ J230IG.I	3.0	6	
Structured Cabling Systems and Power-Limited Technologies - CML			
J271LM.K	4.0	7	
Introduction to Programmable Logic Controllers - 2nd Ed.			
J162LM.A	4.5	8	

Core Curriculum: Course Level and Credit Summary

Torque for the Electrical Industry - CML

Item Code: J242LM.A

Core Curriculum Year: 4

Core Credits

Advanced Credits

1.0

Course Prerequisite(s): None

Other Prerequisites: None

Required Material(s):

- Lesson 1 Torque Theory
- Lesson 2 Hardware—Threaded Fasteners, Bolts, Nuts, and Washers
- Lesson 3 Torque Wrenches and Their Uses
- Lesson 4 Torque Tightening
- Lesson 5 Electrical Torque Applied
- Lesson 6 Resources
- Lesson 7 Support - Labs
- Lesson 8 Final Torque Assessment

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

Item Code: J234LM.N

Core Curriculum Year: 4

Core Credits

Advanced Credits

1.5

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 Raceway

Core Curriculum: Course Level and Credit Summary

Code, Standards, and Practices 5, Based on the 2023 NEC - CML

Item Code: J235LM.N

Core Curriculum Year: 4

Core Credits

Advanced Credits

2.0

Course Prerequisite(s): Code, Standards, and Practices 4

Other Prerequisites: None

Required Material(s):

- *National Electrical Code - 2023 (S1150)*

- Lesson 1 Installing Electrical Services
- Lesson 2 Swimming Pools, Fountains, and Similar Installations
- Lesson 3 Understanding Emergency and Standby Systems Installation Requirements
- Lesson 4 Over 1,000-Volt Installations
- Lesson 5 Remote-Control, Signaling, and Power-Limited Circuits

Motor Code Calculations, Based on the 2023 NEC - CML

Item Code: J227LM.N5

Core Curriculum Year: 4

Core Credits

Advanced Credits

1.0

Course Prerequisite(s): Elect. Code Calc., Lvl I or FCC CML; Motors CML

Other Prerequisites: None

Required Material(s):

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

- Lesson 1 General Rules and Part I of Article 430
- Lesson 2 Sizing Motor Branch-Circuit Conductors
- Lesson 3 Selecting Single Motor Branch-Circuit Short-Circuit and Ground-Fault Protection
- Lesson 4 Sizing Motor Overload Protection
- Lesson 5 Sizing Motor Branch-Circuit Disconnecting Means
- Lesson 6 Calculations for Multi-Load Branch Circuits and Feeders
- Lesson 7 Calculations for Air-Conditioning and Refrigeration Motors
- Lesson 8 Special Applications

Core Curriculum: Course Level and Credit Summary

Motors for Electricians - CML

Item Code: J206LM.K1

Core Curriculum Year: 4

Core Credits

Advanced Credits

4.0

Course Prerequisite(s): Code, Standards, and Practices 3; ET3: AC Theory or AC II

Other Prerequisites: None

Required Material(s):

- ***Motors Textbook (S649)***

- Lesson 1 Magnetism and Induction Review
- Lesson 2 Motor Nameplates
- Lesson 3 AC Alternators
- Lesson 4 Three-Phase Motors
- Lesson 5 Motor Types
- Lesson 6 Single-Phase Motors
- Lesson 7 Motor Protection
- Lesson 8 DC Motors
- Lesson 9 Starting and Stopping Motors
- Lesson 10 Motor Alignment
- Lesson 11 Troubleshooting Motors
- Lesson 12 Resources
- Lesson 13 Support - Labs

Core Curriculum: Course Level and Credit Summary

Motor Control for Electricians - CML

Item Code: J209LM.I1

Core Curriculum Year: 4

Core Credits

Advanced Credits

7.0

Course Prerequisite(s): Motors, Level I/II

Other Prerequisites: None

Required Material(s):

• Fundamentals of Motor Control (S547)

- Lesson 1 Introduction to Motor Control and the Industry
- Lesson 2 Electrical Safety with Motor Controls
- Lesson 3 Symbols, Diagrams, Drawings, and Logic
- Lesson 4 Input and Output Devices
- Lesson 5 Solenoids and Control Relays
- Lesson 6 Control Transformers
- Lesson 7 Motor Control Centers, Contactors, and Motor Starters
- Lesson 8 Timing and Counting Devices
- Lesson 9 Solid-State Devices
- Lesson 10 Programmable Controllers
- Lesson 11 Motor Drives
- Lesson 12 Industrial Networks
- Lesson 13 System-Wide Troubleshooting
- Lesson 14 Resources
- Lesson 15 Support - Labs
- Lesson 16 REMOVED - 1-4-2024 - PRM

Core Curriculum: Course Level and Credit Summary

Load and Service Calculations, Based on the 2023 NEC - CML

Item Code: J227LM.N2

Core Curriculum Year: 4

Core Credits

Advanced Credits

3.0

Course Prerequisite(s): Elect. Code Calc., Lvl I or FCC CML

Other Prerequisites: None

Notifications:

Course coming soon.

Required Material(s):

Building Automation 1: Control Devices and Applications, Level I

Item Code: J238LM.H1

Core Curriculum Year: Advanced

Core Credits

Advanced Credits

1.5

Course Prerequisite(s): None

Other Prerequisites: 4000 Hours of OJT

Required Material(s):

- ***Building Automation: Control Devices (\$518)***

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|----------|---|
| Lesson 1 | Introduction to Building Automation |
| Lesson 2 | Electrical Systems |
| Lesson 3 | Lighting Sources and Controls |
| Lesson 4 | Lighting System Control Devices |
| Lesson 5 | HVAC Systems |
| Lesson 6 | HVAC System Applications |
| Lesson 7 | Automated Building Operation and Applications |

Core Curriculum: Course Level and Credit Summary

Photovoltaics, Level I

 Item Code: **J230IG.I**

Core Curriculum Year: Advanced

Core Credits

Advanced Credits

3.0

Course Prerequisite(s): AC Theory, Level II/III

Other Prerequisites: None

Required Material(s):

- *National Electrical Code - 2008 (S550)*
- *OSHA Standards for the Construction Industry (S125)*
- *Photovoltaic Systems Textbook, 2nd Ed (S574)*

Lesson 1	Introduction to Photovoltaic Systems
Lesson 2	Fundamentals of Solar Radiation
Lesson 3	Sun-Earth Relationships
Lesson 4	Solar Radiation Data and Measurements
Lesson 5	Site Surveys and Planning
Lesson 6	Photovoltaic Systems and Components
Lesson 7	Fundamentals of Photovoltaic Devices
Lesson 8	Photovoltaic Modules and Arrays
Lesson 9	Batteries
Lesson 10	Charge Controllers
Lesson 11	Inverters
Lesson 12	System Sizing
Lesson 13	Mechanical Integration
Lesson 14	Electrical Integration I
Lesson 15	Electrical Integration II
Lesson 16	Utility Interconnection
Lesson 17	Permitting and Inspection
Lesson 18	Operations and Maintenance
Lesson 19	Economic Analysis

Core Curriculum: Course Level and Credit Summary

Structured Cabling Systems and Power-Limited Technologies - CML

Item Code: J271LM.K

Core Curriculum Year: Advanced

Core Credits

Advanced Credits

4.0

Course Prerequisite(s): AC Theory, Level II/III

Other Prerequisites: None

Required Material(s):

• ***Structured Cabling Textbook (S681)***

• ***National Electrical Code - 2023 (S1150)***

Lesson 1	The Need for Structured Cabling Systems
Lesson 2	Structured Cabling Standards and the NEC®
Lesson 3	Cables and Connectors
Lesson 4	Structured Cabling System Performance
Lesson 5	Pathways and Spaces
Lesson 6	Telecommunications Cabling Administration
Lesson 7	Telecommunications Grounding and Bonding
Lesson 8	Configuring Structured Cabling Systems
Lesson 9	Residential Cabling Systems
Lesson 10	Testing Structured Cabling Systems
Lesson 11	Introduction to Fiber Optics
Lesson 12	Power over Ethernet and Class 4, Fault Managed Power

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