

# Residential and Commercial Electrical

Western Monroe & Orleans Counties  
**WEMOCO**  
Career & Technical Education Center

“Enlighten” your future



Learn electrical theory, wiring, and to interpret and apply the requirements of the National Electric Code for residential and commercial construction projects.

## Units of Study

- Electrical Fundamentals
- Introduction to The National Electrical Code
- Conductor Properties
- Basic Wiring Methods
- Basic Electrical Installations/ Grounding
- Emergency Power
- Electrical Planning
- Specialized Electrical Installations
- Professional Techniques for Electricians
- Advanced Wiring Methods
- Advanced Electrical Installations/ Grounding
- Advanced Branch Circuits and Feeders
- Transformers
- Basic Motor Control
- Alternative Energy-Wind/Solar

## Integrated Academics

- English
- Science

## Licensing / Industry- Based Certifications

OSHA 10 Construction Industry

## Work-Based Learning

CTE programs bring students into the workplace for real life experiences. Businesses that support our Electrical program:

- Citygate Electric
- CM Armitage
- Horizon Solutions
- Monroe 2 BOCES Operations and Maintenance
- RADEC Corporation

## Articulation Agreements

Alfred State



## Career Outlook

All CTE programs correlate to many careers paths. Use the links below to explore more. One example:

Job Projections for Electricians:  
13% projected growth in New York State jobs 2016-2026.

New York State salary range:  
\$42,390 entry level- \$95,570 experienced

Education Requirements: Electricians often are trained through a career and technical education program, or through an apprenticeship.

Explore more:

<https://www.careerzone.ny.gov/>  
<https://www.onetonline.org/find/>

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Monroe 2-Orleans Board of Cooperative Educational Services  
Monroe2BOCES.org/cte 585-352-2471  
3589 Big Ridge Road, Spencerport, New York 14559



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## Employability Profile

<u>Career Readiness</u>	
Attendance	_____
Punctuality	_____
Appropriate Workplace appearance	_____
Takes Initiative	_____
High Quality of work	_____
Knowledge of workplace ethics	_____
Responsive to supervisor	_____
Effective Communication skills	_____
Solves problems	_____
Makes decisions	_____
Cooperates with others	_____
Resolves conflict	_____
Observes critically	_____
Takes responsibility for learning	_____
Reads with understanding	_____
Solves problems using math	_____
Complies with health and safety rules	_____
Uses technology appropriately	_____

<u>Safety</u>	
Completed OSHA 10 for Certification	_____
Use of Personal Protective Equipment	_____
Recognize potential accident issues	_____
Lock-out/Tag-out procedures	_____
Inspection of power and hand tools	_____
Fire Safety	_____
First Aid	_____
Ladder Safety	_____

<u>Electrical Fundamentals</u>	
Ohms Law	_____
Series Circuits	_____
Parallel Circuits	_____
Complex circuits	_____
Power Formula	_____

<u>National Electrical Code</u>	
Identify via the NEC book -circuits, devices and wiring code	_____
Interpret the NEC general requirements for installing cables and wiring	_____
Utilize the NEC for ground fault circuit requirements	_____
Utilize the NEC for specialized circuits	_____
Utilize the NEC for arc fault circuit requirements	_____
Utilize the NEC for grounding and bonding requirements	_____

<u>Tools and Testing</u>	
Use of Hand tools	_____
Use of Power tools	_____
Use of Voltage Meter	_____
Use of Ohm Meter	_____
Use of Amp Meter/current clamp	_____

<u>Wiring Methods</u>	
Non Metallic Sheathed Cable	_____
Conduit	_____
Armored Cable	_____
Flexible conduit	_____
PVC conduit	_____

<u>Electrical Installation</u>	
Calculate size of service, minimum number of circuits required for residence size & equipment to be installed	_____
Locate device boxes and correct wiring for residential circuits using the NEC	_____
Install single pole switch circuits, 3-way switch circuits, 4-way switch circuits	_____
Install switched outlet circuits	_____
Install GFCI receptacles and breakers	_____
Install Arc Fault Circuit breakers	_____
Installing duplex outlet circuits in both 15A and 20A configurations	_____
Install small appliance circuits	_____
Size and install Range and Dryer circuits	_____

<u>Electrical Planning</u>	
Read Blueprints for Residential construction	_____
Read Blueprints for Commercial/Industrial construction	_____
Interpret Specifications on prints	_____

<u>Specialized installations</u>	
Farm wiring	_____
Mobile Home Wiring	_____
Swimming Pool Wiring	_____
Telephone and Computer Networking	_____
Emergency and Standby systems	_____

<u>Electrical Professions and Techniques</u>	
Electrical Remodeling	_____
Maintenance and Trouble shooting	_____
Electrical Careers	_____

<u>Motors and Motor Control</u>	
Types of single phase motors	_____
Three Phase Motors	_____
Size motor replacement by use of Frame number	_____
Distinguish and select correct motor enclosure types based on applications	_____
AC motor wire and fuse installation	_____
Install 3 wire motor control for Start/Stop	_____
Repairing motor contactors, replacing contact, coils and Overloads	_____
Troubleshoot 3 wire motor control circuits	_____
Use the NEC to correctly size motor wire and components	_____

<u>Solar Energy</u>	
Demonstrated ability To Work With Solar Panels Safely	_____
Locate and Site Solar Panels	_____
Determine System Types- Grid-Tie, Storage or Back-up Systems	_____

<u>Technical Math</u>	
Use Ohms Law for circuit Calculations	_____
Use Formula for Box Fill	_____
Use formula For Conduit Fill	_____
Use Formula For Voltage Drop of Wire	_____