

WBL and the Virginia Energy Cluster Curricula

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Energy Career Cluster

- *The Energy career cluster focuses on how we get from energy sources like natural gas or solar photovoltaics to electrical power or gas in homes and industries **for** transportation, production, and construction. It is about energy efficiency and sustainability as we consider the environment and consequences of technology.*

4 Pathways & 10 Courses

Fuels Production

- Energy Source Life Cycle
- Application of Engineered Energy Systems

Power Generation

- Fundamentals of Power Generation
- Power Generation Design and Function
- Energy and Power

Energy Transmission, Distribution, and Storage

- Energy Transmission and Distribution
- Energy Transmission and Distribution, Advanced

Energy Sustainability and Efficiency

- Energy Supply Sustainability and Efficiency
- Energy Demand Sustainability and Efficiency
- Renewable Energy

Post-Secondary Energy Education

Community Colleges

Power Line Worker – 2

Solar Technician – 3

Career Studies Certificates – 9

Associate Degrees – 4

Total Energy Technology (ENE) Courses - 27

4-Year Colleges / Universities

James Madison University

Old Dominion University

University of Virginia

Virginia Commonwealth University

Virginia Tech

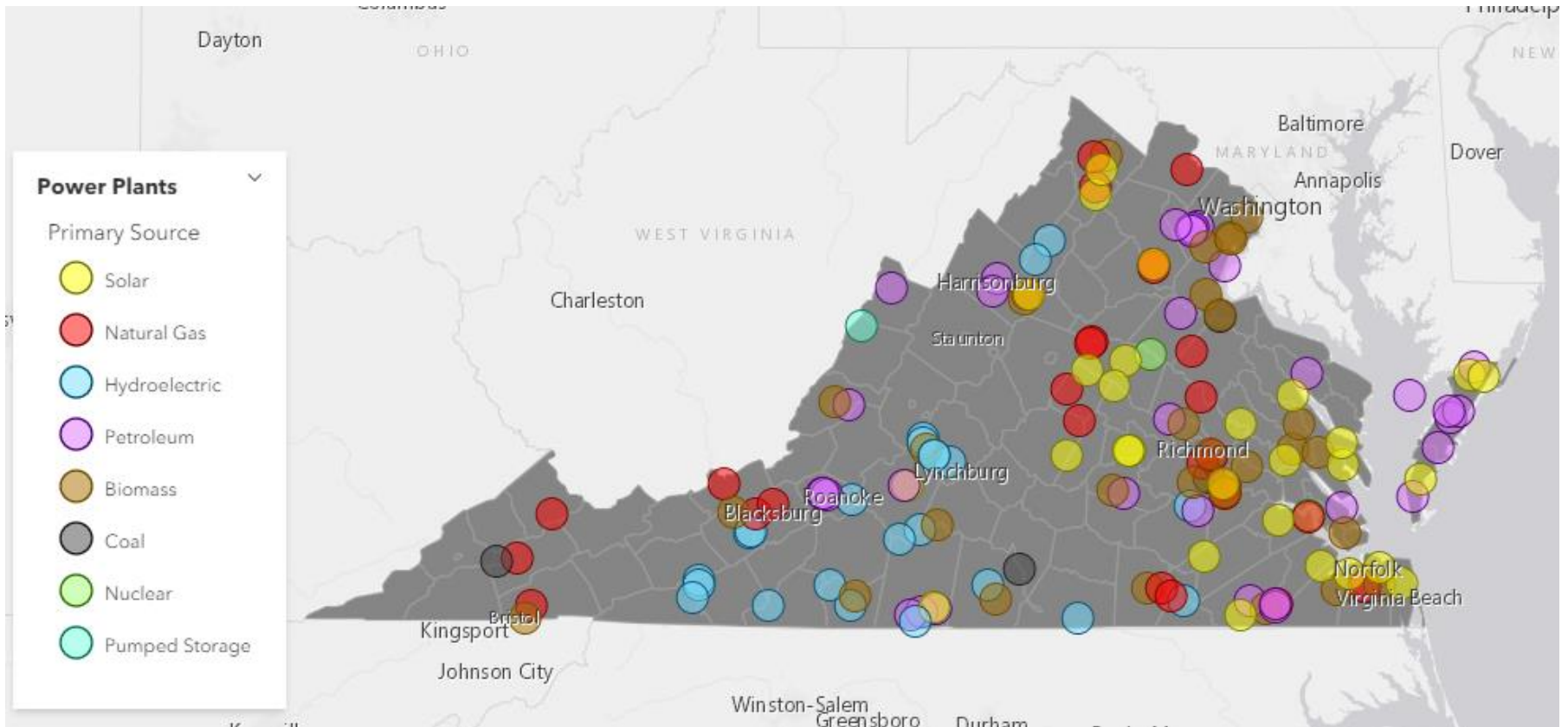
Energy Industry Demand in Virginia

Job Classification	2018 Jobs	2028 Jobs	Change	2019-2023 Projected Retirements / Attrition	2024-2028 Projected Retirements / Attrition
Lineworker	1443	1519	76	468	187
Plant / Field Operators	696	677	-19	293	68
Technicians	1434	1462	28	514	164
Engineers	996	1003	7	676	113
Customer Service	799	840	41	116	96
TOTALS	5368	5501	133	2067	628

Source: 2019 CEWD Energy Workforce Demand Report

- Data Sources: Quarterly Census of Employment and Wages (QCEW); Regional Economic Information System (REIS); State data compiled from various State agencies.
- Projected attrition / retirements rates taken from CEWD's energy industry survey results.
- Contains data on utility industries that are publicly owned or operated.
- Does NOT include contractor or industry supplier demand data

Energy Production in Virginia by Facility



energy

Sort by Hours More filters

CleanChoice Energy

4.2 (304) Electric utility company - 1055 Thomas Jefferson St NW #650 Open until 8:00 PM · (800) 317-3141

Website Directions

SkyBuilt Power

Solar energy equipment supplier - 2500 Wilson Blvd #215 (703) 276-7592

Directions

Falvez Energy

Solar energy company - 1212 New York Ave NW (202) 618-7143

Website Directions

Win for Energy LLC

Solar energy equipment supplier - 1300 I St NW #600 (202) 220-3115

Website Directions

Energy USA Inc

Water utility company - 1776 I St NW #725 (202) 785-9260

Website Directions

Touchstone Energy Cooperatives

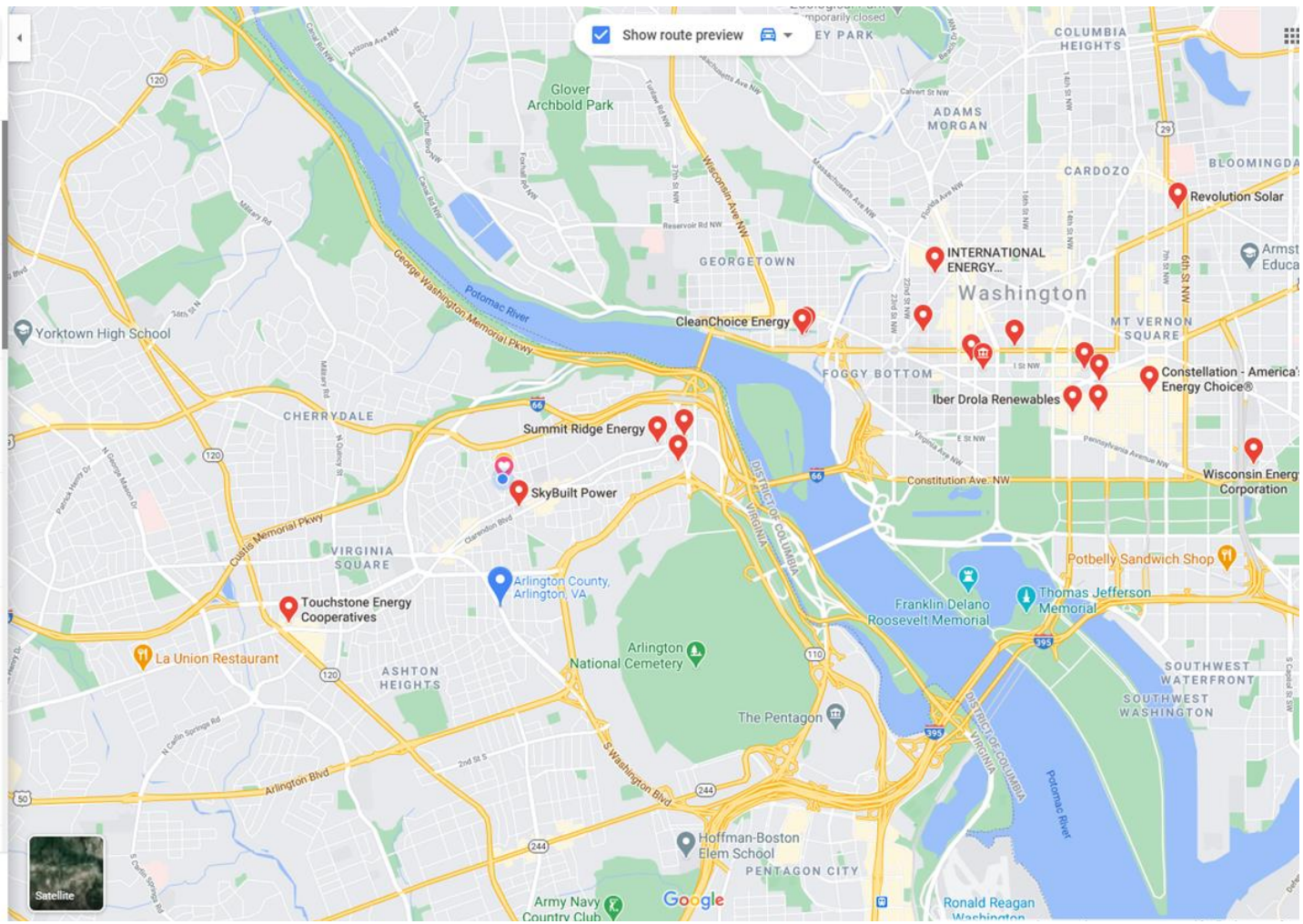
Electric utility company - 4301 Wilson Blvd (703) 907-5500

Website Directions

Wisconsin Energy Corporation

Showing results 1 - 20

Update results when map moves



Show route preview



Satellite

Google

Industry Internships





RETURN
ON
INVESTMENT

“THE EXPERIENTIAL BARGAIN”



STUDENTS



COMPANIES

EXPERIENTIAL LEARNING

THEORY APPLICATION

REAL PROJECTS, REAL STAKES

SKILLS DEVELOPMENT

PROFESSIONAL NETWORKING

REFERENCE-WORTHY EXPERIENCE



EXPERIENTIAL HIRING

FRESH IDEAS

COST EFFECTIVE SOLUTIONS

TRAINING & ON-BOARDING

EMPLOYER BRANDING

EVALUATED TALENT

Roles or Types?



- Real labor, often paid by others
- Defined term of employment (an experiment)
- School and community engagement
- Industry engagement
- Leadership training for newer managers
- Internal workforce development
- Community college / university collaboration
- Long-time customers
- Your thoughts?



Examples:

- **Data aggregation**
- **Spreadsheets**
- **GIS tools**
- **AI Tools**
- **Legislation tracking**
- **Windows shortcuts**
- **ONet data**
- **Presentations!**

Where to recruit mentors?

WIOA Regional Workforce Councils

Technology Councils

Chambers of Commerce

Leadership Organizations

NAACP Chapters

Professional Associations

Trade Associations

Community Foundations

Effective Mentoring Training



MENTORING



GOALS



COACHING



GUIDANCE



TRAINING



MOTIVATION



KNOWLEDGE



SUPPORT



SUCCESS

Mentoring Strategies and Messages

- Shared responsibility for mentorship
- Managing people is difficult
- Alignment with your org's practices and tools
- Utilizing interactive team tools
- Include interns in meetings
- Presentations, blog posts, drafts for your social media posts
- Agreements and templates
- Be flexible and forgiving



Mentoring Strategies vary by Work Environments

OFFICES vs TRADES

- Emphasis on Safety
- Shared responsibility for mentorship
- Managing people is difficult
- Alignment with your org's practices and tools
- Utilizing interactive team tools
- Include interns in meetings
- Presentations, blog posts, drafts for your social media posts
- Agreements and templates
- Be flexible and forgiving

Encouraging Projects and PjBL

Likely applicable to most workplaces

Makes college recommendations and references easy

Our typical approach:

- 30% helping us do what we do,
- 40% small projects research,
- 30% pursuing their own relevant interests
(with my support)

Meaningful, transformative experiences

Self-awareness, Self-Efficacy, Self-Advocacy, Self-Actualization



In my WBL programs, everyone is introduced to:

- Physical Computing and Microelectronics
- Programming in multiple languages
(Scratch/MakeCode, C++, Python, Javascript)
- Automated systems - sensors, indicators, actuators
- Public Policy - bill tracking
- ArcGIS or Google MyMaps
- Spreadsheets
- Google Drive, Teams, Slack

Agreements, Templates

- Mentorship Agreement
- https://docs.google.com/document/d/1_QuVpFa3_6zVPUsz1_3buN0sfM1oJ7IQ/edit

Internship Planning Template

https://docs.google.com/document/d/1ibGT_bXDvKTH_Av2VkP7m7vauksOD3zAb6dA3zKRDkc/edit

Psychometrics

Myers-Briggs

- Extrovert-Introvert,
- Intuitive or Sensing,
- Thinking or Feeling,
- Perceptive or Judging

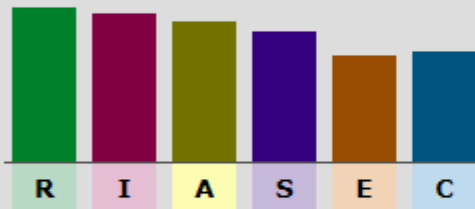
DiSC Profile

- Dominance
- Influence
- Steadiness
- Compliance



Holland's RIASEC

O*NET Interest Profiler



Realistic	32
Investigative	31
Artistic	29
Social	27
Enterprising	22
Conventional	23

Here are your Interest Profiler results!

Think of your interests as work you like to do.

Your interests can help you find careers you might like to explore. The more a career meets your interests, the more likely it will be satisfying and rewarding to you.

You can click on any interest below to learn more. When you're ready, click **Next** to continue.

- [Realistic](#)
- [Investigative](#)
- [Artistic](#)
- [Social](#)
- [Enterprising](#)
- [Conventional](#)



STEM Habits of Mind

Critical Thinking

Predictions

Using Data

Analysis and Evaluation

Real-World applications

Observation

Creative or Innovative Solutions

Communication and Documentation

Collaboration

Reflection

Problem-Solving

Making Mistakes

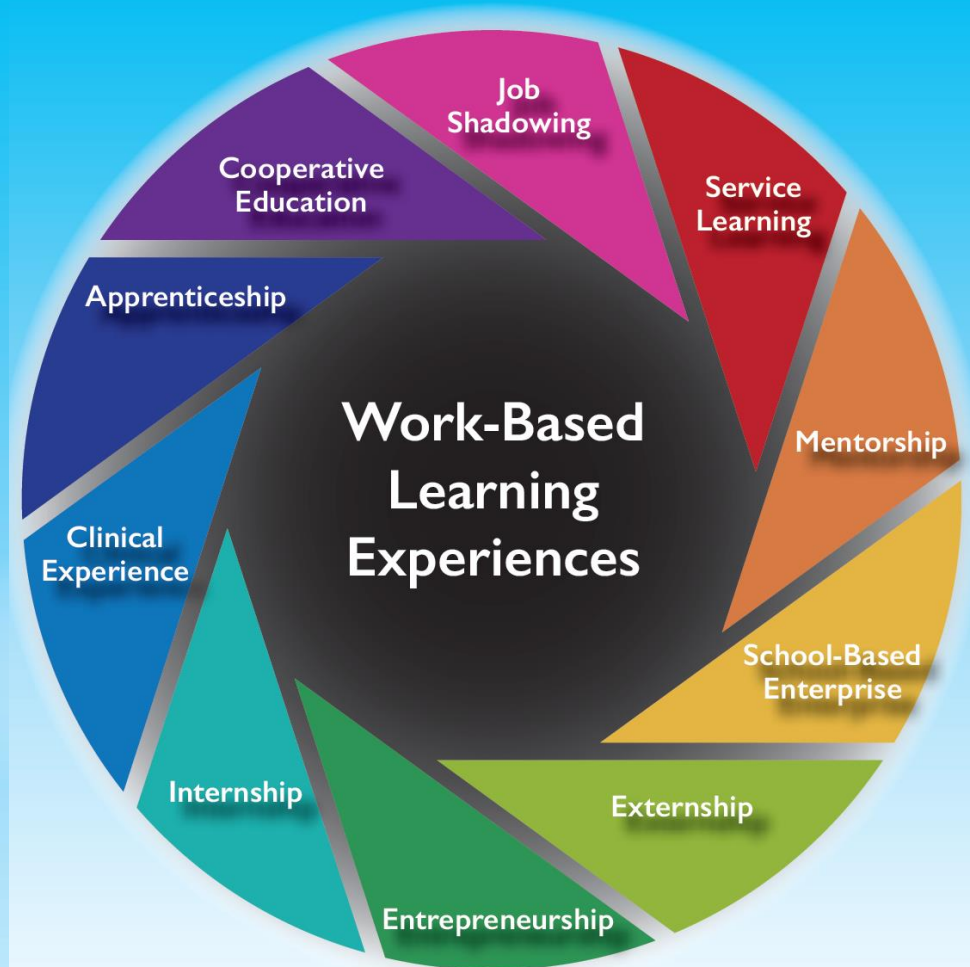
Work

Jobs

Careers

17-18 Career Clusters

- Agriculture, Food, and Natural Resources
- Architecture and Construction
- Arts, Audio/Video Technology and Communications
- Business Management and Administration
- Education and Training
- Energy
- Finance
- Government and Public Administration
- Health Science
- Hospitality and Tourism
- Human Services
- Information Technology
- Law, Public Safety, and Corrections
- Manufacturing
- Marketing
- Science, Technology, Engineering, and Math
- Telecommunications
- Transportation, Distribution, and Logistics



High-Quality Work-Based Learning Opportunities in Virginia

WBL Experience	Suggested Grade levels	Related CTE instruction	Training agreement	Training plan	Minimum duration	Paid option	Credit option
Job Shadowing	6-12	✓	✓		Varies by type		
Service Learning	6-12	✓	✓		Varies by type		
Mentorship	6-12	✓	✓		Course duration or 140 hours for .5 credit option		✓
Externship	6-12	✓	✓		40 hours		
School-Based Enterprise	6-12	✓	✓		Course duration	✓	
Internship	11-12	✓	✓	✓	Course duration or 280 hours for 1 credit option	✓	✓
Entrepreneurship	11-12	✓	✓	✓	Course duration or 280 hours for 1 credit option	✓	✓
Clinical Experience	11-12	✓	✓		Varies by type		
Cooperative Education	11-12	✓	✓	✓	280 hours for 1 credit option	✓	✓
Youth Registered Apprenticeship	11-12	✓	✓		280 hours for 1 credit option	✓	✓
Registered Apprenticeship	11-12	✓	✓		144 hrs. RTI per 2,000 hrs. OJT	✓	
SAE (Immersion)	6-12	✓	✓	✓	280 hours for 1 credit option	✓	✓

Jobs or Careers that Interest You:



O*net Online: www.onetonline.org



Q electrician Go



Introduction

Occupation Keyword Search

Q dental assistant

Examples: 25-1011.00, dental assistant

Search O*NET-SOC occupations

Find Occupations

- Bright Outlook
- Career Cluster
- Hot Technology
- Industry
- Job Family
- Job Zone
- STEM
- All Occupations

"I want to be a..."

Start the career you've dreamed about, or find one you never imagined. Discover your interests with the [O*NET Interest Profiler](#) and find more exploration options at [My Next Move](#).

Find your career at My Next Move

ATTN: VETERANS

Put your military skills and experience to work in civilian life.

Army (MOS)

Q 15W Go

Learn more at My Next Move for Veterans

¿Habla español?



[Mi Próximo Paso](#) incluye tareas, aptitudes, información sobre salarios y más de 600 carreras diferentes.

Occupation Keyword Search

Occupations matching "electrician"

Search again:

20 occupations shown Show matches:

Code	Occupation
47-2111.00	Electricians
47-3013.00	Helpers--Electricians
49-2092.00	Electric Motor, Power Tool, and Related Repairers
49-2093.00	Electrical and Electronics Installers and Repairers, Transportation Equipment
49-9051.00	Electrical Power-Line Installers and Repairers
49-2095.00	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay
49-2094.00	Electrical and Electronics Repairers, Commercial and Industrial Equipment
49-9012.00	Control and Valve Installers and Repairers, Except Mechanical Door
51-8013.04	Hydroelectric Plant Technicians
49-9071.00	Maintenance and Repair Workers, General  Bright Outlook
49-9097.00	Signal and Track Switch Repairers
49-2096.00	Electronic Equipment Installers and Repairers, Motor Vehicles
51-2023.00	Electromechanical Equipment Assemblers
47-1011.00	First-Line Supervisors of Construction Trades and Extraction Workers
49-9043.00	Maintenance Workers, Machinery 
53-7021.00	Crane and Tower Operators



Electrical Power-Line Installers & Repairers

Print Share

Also called: Electrical Lineman, Lineworker, Power Lineman, Service Man

What they do:

Install or repair cables or wires used in electrical power or distribution systems. May erect poles and light or heavy duty transmission towers.

On the job, you would:

- Adhere to safety practices and procedures, such as checking equipment regularly and erecting barriers around work areas.
- Drive vehicles equipped with tools and materials to job sites.
- Open switches or attach grounding devices to remove electrical hazards from disturbed or fallen lines or to facilitate repairs.

KNOWLEDGE

Engineering and Technology

- building and construction
- mechanical

Arts and Humanities

- English language

Education and Training

- teaching and course design

Safety and Government

- public safety and security

SKILLS

Basic Skills

- listening to others, not interrupting, and asking good questions
- keeping track of how well people and/or groups are doing in order to make improvements

Problem Solving

- noticing a problem and figuring out the best way to solve it

People and Technology Systems

- figuring out how a system should work and how changes in the future will affect it
- thinking about the pros and cons of different options and picking the best one

ABILITIES

Hand and Finger Use

- keep your arm or hand steady
- hold or move items with your hands

Controlled Movement

- use your arms and/or legs together while sitting, standing, or lying down
- quickly change the controls of a machine, car, truck or boat

Ideas and Logic

- notice when problems happen
- use rules to solve problems

Endurance

- exercise for a long time without getting out of breath



Electrical Power-Line Installers and Repairers

49-9051.00

Updated 2023

Install or repair cables or wires used in electrical power or distribution systems. May erect poles and light or heavy duty transmission towers.

Sample of reported job titles: Class Gloving Electrical Lineman, Class Rubber Gloving Lineman, Electrical Lineman, Electrical Lineworker, Lineworker, Power Lineman, Power Lineman Technician, Service Man, Third Step Lineman, Troublemán

Summary

[Details](#)

[Custom](#)

[Easy Read](#)

[Veterans](#)

[Español](#)

Contents ▾

Occupation-Specific Information

Tasks

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- Adhere to safety practices and procedures, such as checking equipment regularly and erecting barriers around work areas.
- Drive vehicles equipped with tools and materials to job sites.
- Open switches or attach grounding devices to remove electrical hazards from disturbed or fallen lines or to facilitate repairs.
- Climb poles or use truck-mounted buckets to access equipment.
- Install, maintain, and repair electrical distribution and transmission systems, including conduits, cables, wires, and related equipment, such as transformers, circuit breakers, and switches.

Technology Skills

▾ 5 of 9 displayed

Emphasize flexibility, adaptability, innovation, technical skills, self-reliance, and self-actualization.

The perfect Job

- ✓ good salary
- ✓ benefits
- ✓ job security
- ✓ close to home



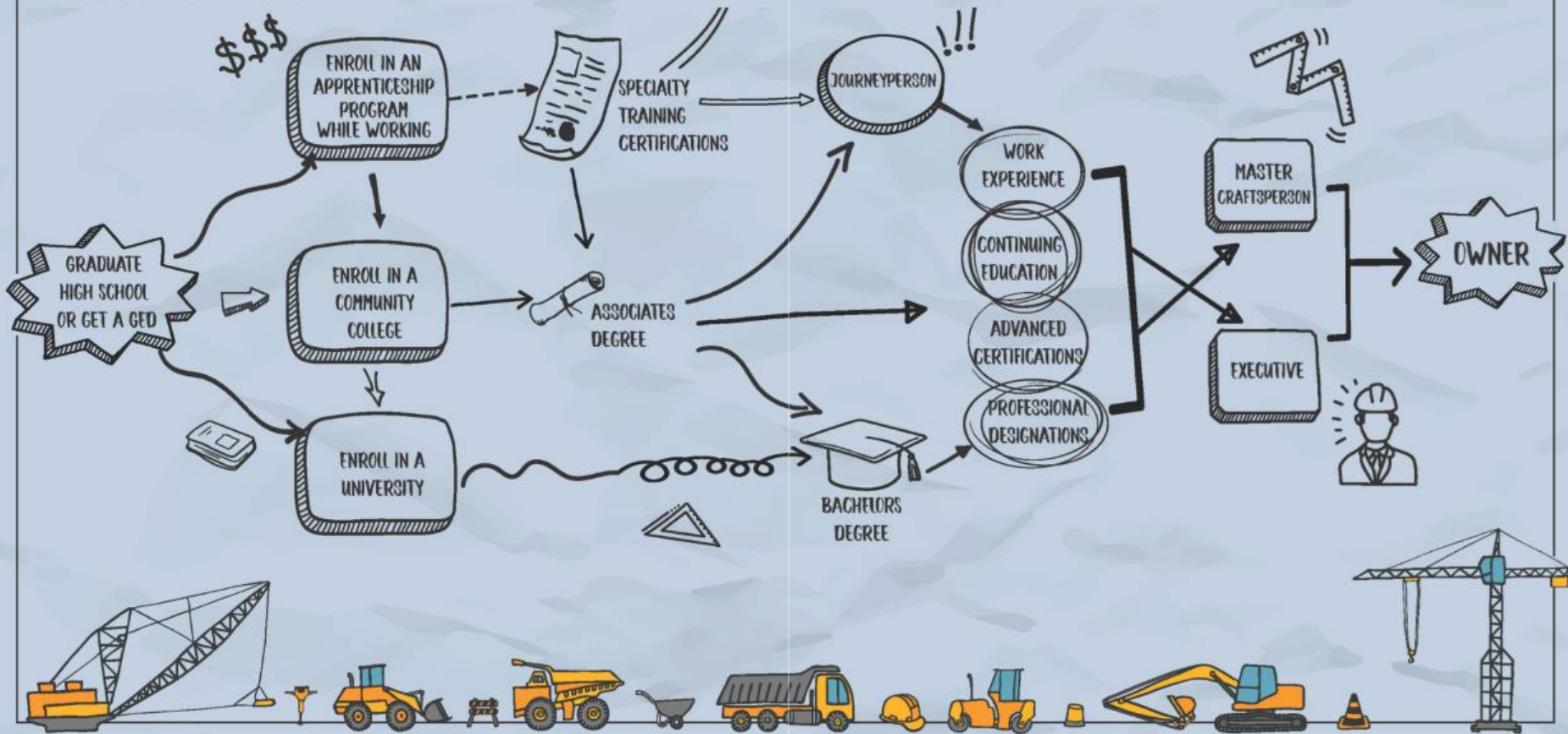
INTERESTING / MEANINGFUL WORK



What Do Teens Want in a Career?



PATHWAYS



Choosing a major or minor



STEM

non-STEM

Both (please!)

What might they learn from their internship?

- Office operations and roles
- Interpersonal skills
- Computer networks
- Teamwork
- Meeting dynamics
- Professional skills
- Academic and career paths



Executive Function Control Center

Define Problem/ Assess Need	Self-Motivate/ Self-Direct	Monitor Progress	Regulate Emotions and Behavior
Apply Prior Knowledge	Initiate Action/ Implement Plan	Exhibit Flexibility	Sustain Effort
Set Goals	Concentrate/ Stay Focused	Make Decisions/ Solve Problems	Complete Tasks/ Achieve Goals
Organize/ Prioritize	Manage Time	Make Adjustments/ Corrective Actions	Evaluate Results
Develop Plan	Manage Resources	Ask for Help	Plan to Improve

source: Excellence in School Counseling

Virtual and Hybrid Strategies

- Scheduled check-in calls
- This Week and Next reporting
- Time sheets (consulting style)
- Mini presentations
- Budgets (time, resources)
- Research summaries - blog posts?
- Wiki formats
- Texting
- Check for Email
- Models / examples of work for comparison
- Constructive feedback
- Work buddy
- Skills workshops

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