



Energy Career Cluster

The Energy career cluster prepares individuals for careers in the designing, processing, planning, maintaining, generating, transmission, and distribution of traditional and alternative energy. This career cluster includes occupations ranging from petroleum engineers, rotary drill operators, chemical technicians, and power plant operators to solar photovoltaic installers and wind turbine service technicians.

Statewide Program of Study: Renewable Energy

The Renewable Energy program of study focuses on occupational and educational opportunities associated with assembling, inspecting, maintaining, and repairing different equipment required for renewable energy. This program of study includes exploration of solar photovoltaic equipment and wind turbines and the systems and processes used to maintain and manage these types of equipment.



Secondary Courses for High School Credit

Level 1	- Foundations of Energy - Principles of Applied Engineering
Level 2	- Electrical Technology I - AC/DC Electronics
Level 3	- Energy and Natural Resources Technology - Solid State Electronics - Digital Electronics - Environmental Engineering - Electrical Technology II
Level 4	- Engineering Design and Problem Solving - Applied Mathematics for Technical Professionals - Career and Technical Education Project-Based Capstone - Practicum in Energy - Practicum in Engineering - Practicum in Engineering + Extended Practicum in Engineering - Career Preparation for Programs of Study - Career Preparation for Programs of Study + Extended Career Preparation - Scientific Research and Design

Work-Based Learning and Expanded Learning Opportunities

Work-Based Learning Activities	- Shadow a wind turbine service technician at a wind farm to learn about maintaining wind turbine equipment - Intern at a solar power company and engage in planning for a solar roof installation in your community
Expanded Learning Opportunities	- Tour a wind turbine or solar farm - Participate in SkillsUSA

Aligned Industry-Based Certifications

- C-200 Certified Industry 4.0 Automation Systems Specialist I - 201 Electrical Systems 1
- Core
- Electrical Apprenticeship Certificate Level 1
- Electrical Level I
- Electrical Level II
- Electronic System Technician Level I
- Electronic System Technician Level II
- Fundamentals of Electricity - AC/DC
- Fundamentals of Industrial Wiring
- HBI Pre-Apprenticeship Certificate Training (PACT), Basic Electrical
- HBI Pre-Apprenticeship Certificate Training (PACT), Core
- Industrial Technology Maintenance (ITM) - Electrical Systems
- Industrial Technology Maintenance (ITM) - Process Control Systems
- Interim Credential
- Introduction to Electronics
- Residential Appliance Installer
- Residential Wireman
- TRIO Electrical Pre-Apprenticeship (EPP) Certification



Example Postsecondary Opportunities

Associate Degrees

- Electrical, Electronic, and Communications Engineering Technology/Technician
- Instrumentation Technology/Technician
- Energy Systems Technology/Technician
- Solar Energy Technology/Technician



Bachelor's Degrees

- Electrical and Electronics Engineering
- Energy Systems Technology/Technician
- Mechanical/Mechanical Engineering Technology/Technician
- Electromechanical/Electromechanical Engineering Technology/Technician

Master's, Doctoral, and Professional Degrees

- Electrical and Electronics Engineering
- Construction Engineering
- Construction Management, General



Example Aligned Occupations

Electrical and Electronic Engineering Technologists and Technicians

Median Wage: \$64,216
Annual Openings: 825
10-Year Growth: 14%

Wind Turbine Service Technicians

Median Wage: \$59,288
Annual Openings: 909
10-Year Growth: 102%

Electrical Engineers

Median Wage: \$102,706
Annual Openings: 1,097
10-Year Growth: 21%

Data Source: TexasWages, Texas Workforce Commission. Retrieved 3/8/2024.



For more information visit:
<https://tea.texas.gov/academics/college-career-and-military-prep/career-and-technical-education/e-renewable-energy-extended.pdf>



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Statewide Program of Study: Renewable Energy

Course Information

Level 1

Course	Prerequisites Corequisites	Career Clusters
Foundations of Energy* 13040503 (1 credit)	Prerequisites: None Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	
Principles of Applied Engineering 13036200 (1 credit)	Prerequisites: None Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	

Level 2

Course	Prerequisites Corequisites	Career Clusters
Electrical Technology I 13005600 (1 credit)	Prerequisites: None Corequisites: None Recommended Prerequisites: Principles of Architecture or Principles of Construction Recommended Corequisites: None	
AC/DC Electronics 13036800 (1 credit)	Prerequisites: None Corequisites: None Recommended Prerequisites: Principles of Applied Engineering Recommended Corequisites: None	

Level 3

Course	Prerequisites Corequisites	Career Clusters
Energy and Natural Resource Technology 13001100 (1 credit)	Prerequisites: None Corequisites: None Recommended Prerequisites: A minimum of one credit from the courses in the AFNR career cluster Recommended Corequisites: None	
Solid State Electronics 13036900 (1 credit)	Prerequisites: AC/DC Electronics Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	
Digital Electronics 13037600 (1 credit)	Prerequisites: Algebra I and Geometry Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	
Environmental Engineering 12756010 (1 credit)	Prerequisites: At least one credit in a course from the Engineering or Energy career cluster Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	

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* Indicates course is included in more than one program of study in this career cluster.

For additional information on the **Energy** career cluster, contact cte@tea.texas.gov or visit <https://tea.texas.gov/cte>



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Statewide Program of Study: Renewable Energy

Course Information

Level 3

Course	Prerequisites Corequisites	Career Clusters
Electrical Technology II 13005700 (2 credits)	Prerequisites: Electrical Technology I Corequisites: None Recommended Prerequisites: Principles of Architecture or Principles of Construction Recommended Corequisites: None	 

Level 4

Course	Prerequisites Corequisites	Career Clusters
Engineering Design and Problem Solving 13037300 (1 credit)	Prerequisites: Algebra I, Geometry, and at least one credit in a Level 2 or higher course in the Engineering career cluster Corequisites: None Recommended Prerequisites: Engineering Science, chemistry, or physics Recommended Corequisites: Engineering Science, chemistry, or physics	 
Applied Mathematics for Technical Professionals* 12701410 (1 credit)	Prerequisites: None Corequisites: None Recommended Prerequisites: Algebra I and Geometry Recommended Corequisites: None	 
Career and Technical Education Project-Based Capstone* First Time Taken: 12701101 (1 credit)	Prerequisites: None Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	         
Practicum in Energy* N1303910 (2 credits)	Prerequisites: None Corequisites: None Recommended Prerequisites: At least one of the following courses: Oil and Gas Production II/Lab, Occupational Safety and Environmental Technology I, Oil and Gas Production III, Occupational Safety and Environmental Technology II, Career Preparation, Oil and Gas Production IV, Introduction to Process Technology, Introduction to Instrumentation and Electrical, Petrochemical Safety, Health, and Environment, Advanced Instrument and Electrical, AC/DC Electronics, Introduction to Renewable Energy, Energy and Natural Resources Technology/Lab, Environmental Sustainability (PLTW), Solid State Electronics, Scientific Research and Design, or Digital Electronics Recommend Corequisites: None	

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Course Information

Level 4

Course	Prerequisites Corequisites	Career Clusters
Practicum in Engineering First Time Taken: 12756080 (2 credits) Second Time Taken: 12756090 (2 credits)	Prerequisites: Algebra I and Geometry and a minimum of two credits with at least one course in a Level 2 or higher course from the Engineering career cluster Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	
Practicum in Engineering + Extended Practicum in Engineering First Time Taken: 12756085 (3 credits) Second Time Taken: 12756095 (3 credits)	Prerequisites: Algebra I and Geometry and a minimum of two credits with at least one course in a Level 2 or higher course from the Engineering career cluster Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	
Career Preparation for Programs of Study* First Time Taken: 12701121(2 credits)	Prerequisites: At least one Level 2 or higher CTE course Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	
Career Preparation for Programs of Study + Extended Career Preparation* First Time Taken: 12701141 (3 credits)	Prerequisites: At least one Level 2 or higher CTE course Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	
Scientific Research and Design 13037200 (1 credit)	Prerequisites: Biology, and one credit of the following: Physics for Engineering, chemistry, Integrated Physics and Chemistry (IPC), or physics Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	

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