Revised–Oct 2024

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 Sustainability (PLTW) • 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 Science, Technology, Engineering, and Mathematics • Practicum in Science, Technology, Engineering, and Mathematics + Extended Practicum in Science, Technology, Engineering, and Mathematics • Career Preparation for Programs of Study • Career Preparation for Programs of Study + Extended Career Preparation • Scientific Research and Design

Aligned Advanced Academic Courses

AP or IB	AP Physics 1 IB Physics SL IB Physics HL
Dual Credit	Dual credit offerings will vary by local education agency.

Students should be advised to consider these course opportunities to enrich their preparation. AP or IB courses not listed under the Secondary Courses for High School Credit section of this framework document do not count towards concentrator/completer status for this program of study.

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
- Industrial Technology Maintenance (ITM) - Electrical Systems
- NCCER Core
- NCCER Electronic System Technician Level I
- NCCER Electronic System Technician Level II
- Electrical Apprenticeship Certificate Level I
- NCCER Electrical Level I
- NCCER Electrical Level II
- HBI Pre-Apprenticeship Certificate Training (PACT), Core
- HBI Pre-Apprenticeship Certificate Training (PACT), Basic Electrical
- TRIO Electrical Pre-Apprenticeship (EPP) Certification
- Industrial Technology Maintenance (ITM) - Process Control Systems

Successful completion of the Renewable Energy program of study will fulfill requirements of the STEM endorsement if the math and science requirements are met or the Business and Industry endorsement.

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

Electric and Electronic Engineering Technologists and Technicians
Median Wage: $62,968
Annual Openings: 1,156
10-Year Growth: 14%

Wind Turbine Service Technicians
Median Wage: $56,641
Annual Openings: 397
10-Year Growth: 102%

Electrical Engineers
Median Wage: $102,534
Annual Openings: 1,271
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/programs-of-study-additional-resources

Renewable Energy

Energy Career Cluster

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 Resources 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 Sustainability (PLTW) N1303746 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	

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

For additional information on the **Energy** career cluster,
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Energy Career Cluster

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 and Geometry **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
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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Energy Career Cluster

Statewide Program of Study: Renewable Energy

Course Information

Level 4

Course	Prerequisites | Corequisites	Career Clusters
Practicum in Science, Technology, Engineering, and Mathematics First Time Taken: 13037400 (2 credits) Second Time Taken 13037410 (2 credits)	**Prerequisites:** Algebra I and Geometry **Corequisites:** None **Recommended Prerequisites:** Two STEM career cluster credits **Recommended Corequisites:** None	
Practicum in Science, Technology, Engineering, and Mathematics + Extended Practicum in Science, Technology, Engineering, and Mathematics First Time Taken: 13037405 (3 credits) Second Time Taken: 13037415 (3 credits)	**Prerequisites:** Algebra I and Geometry **Corequisites:** None **Recommended Prerequisites:** Two STEM career cluster credits **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:** Career Preparation for Programs of Study **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Scientific Research and Design 13037200 (1 credit)	**Prerequisites:** Biology, Chemistry, Integrated Physics and Chemistry (IPC), or Physics **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	

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