

# **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: Oil and Gas Exploration and Production

The Oil and Gas Exploration and Production program of study focuses on occupational and educational opportunities associated with processing, refining, and distributing petroleum and gas. This program of study includes the process of regulating the flow of oil into pipelines, controlling pumping systems, and operating and maintaining machinery to generate electric power.

Secondary Courses for High School Credit

	Level 1	<ul><li>Oil and Gas Production I</li><li>Foundations of Energy</li></ul>
	Level 2	<ul> <li>Oil and Gas Production II</li> <li>Occupational Safety and Environmental Technology I</li> </ul>
	Level 3	<ul> <li>Oil and Gas Production III</li> <li>Occupational Safety and Environmental Technology II</li> </ul>
	Level 4	<ul> <li>Oil and Gas Production IV</li> <li>Applied Mathematics for Technical Professionals</li> <li>Career and Technical Education Project-Based Capstone</li> <li>Practicum in Energy</li> <li>Career Preparation for Programs of Study</li> <li>Career Preparation for Programs of Study + Extended Career Preparation</li> </ul>



	AP Chemistry
AP or IB	IB Chemistry SL
	IB Chemistry 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	<ul> <li>Shadow a chemical engineer in a lab at an oil and gas production company to learn about biofuels and other technologies that use oil</li> <li>Intern in petroleum engineering to learn about planning, installing, and inspecting facilities for oil extraction</li> </ul>
Expanded Learning Opportunities	<ul> <li>Tour oil and gas production facilities</li> <li>Participate in SkillsUSA</li> <li>Shadow a technician in the oil and gas industry</li> </ul>

### **Aligned Industry-Based Certifications**

NCCER Core

NCCER Instrumentation Level I

• Certified Logistics Technician (CLT)

- Certified Production Technician (CPT) 4.0
- Lean Six Sigma Green Belt Certification



Chemical Process Technology

### **Bachelor's Degrees**

- Mechanical Engineering
- **Chemical Engineering**
- Engineering/Industrial Management
- Industrial Engineering

### Master's, Doctoral, and Professional Degrees

- Mechanical Engineering
- **Chemical Engineering**
- Engineering/Industrial Management
- Industrial Engineering



### **Example Aligned Occupations**

### Rotary Drill Operators, Oil and Gas

Median Wage: \$52,000 Annual Openings: 914 10-Year Growth: 43%

### Industrial Engineering Technologists and Technicians

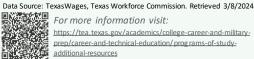
Median Wage: \$62,096 Annual Openings: 787 10-Year Growth: 17%

### **Petroleum Engineers**

Median Wage: \$134,225 Annual Openings: 1,443 10-Year Growth: 27%



Successful completion of the Oil and Gas Exploration and Production program of study will fulfill requirements of the Business and Industry endorsement.



For more information visit: https://tea.texas.gov/academics/college-career-and-militaryprep/career-and-technical-education/programs-of-studyadditional-resources



**Oil and Gas Exploration** 

Production

and



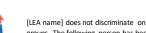
Statewide Program of Study: Oil and Gas Exploration and Production

## **Course Information**

Course	Prerequisites   Corequisites	Career Clusters
<b>Oil and Gas Production I</b> 13001250 (1 credit)	Prerequisites: None Corequisites: None Recommended Prerequisites: None Recommend Corequisites: None	China
Foundations of Energy* 13040503 (1 credit)	Prerequisites: None Corequisites: None Recommended Prerequisites: None Recommend Corequisites: None	
Course	Prerequisites   Corequisites	Career Clusters
<b>Oil and Gas Production II</b> 13001260 (1 credit)	Prerequisites: Oil and Gas Production I Corequisites: None Recommended Prerequisites: None Recommend Corequisites: None	
Occupational Safety and Environmental Technology I N1303680 (1 credit)	Prerequisites: None Corequisites: None Recommended Prerequisites: None Recommend Corequisites: None	<b>1 2 1</b>
Course	Prerequisites   Corequisites	Career Clusters
Oil and Cas Production III	Prerequisites: Oil and Gas Production II	Å

<b>Oil and Gas Production III</b> 13040500 (1 credit)	Prerequisites: Oil and Gas Production II Corequisites: None Recommended Prerequisites: None Recommend Corequisites: None	
Occupational Safety and Environmental Technology II N1303681 (1 credit)	Prerequisites: Occupational Safety and Environmental Technology I Corequisites: None Recommended Prerequisites: None Recommend Corequisites: None	2

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



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

[LEA name] does not discriminate on the basis of race, color, national origin, sex, or disability in its programs or activities and provides equal access to the Boy Scouts and other designated youth groups. The following person has been designated to handle inquiries regarding the nondiscrimination policies: [title], [address], [telephone number], [email]. Further nondiscrimination information can be found at <u>Notification of Nondiscrimination in Career and Technical Education Programs</u>.



Statewide Program of Study: Oil and Gas Exploration and Production

## **Course Information**

Course	Prerequisites   Corequisites	Career Clusters
<b>Oil and Gas Production IV</b> 13040501(1 credit)	Prerequisites: Oil and Gas Production III Corequisites: None Recommended Prerequisites: None Recommend Corequisites: None	
Applied Mathematics for Technical Professionals* 12701410 (1 credit)	Prerequisites: Algebra I and Geometry Corequisites: None Recommended Prerequisites: None Recommend Corequisites: None	<b>M 2</b>
Career and Technical Education Project-Based Capstone* First Time Taken: 12701101 (1 credit)	Prerequisites: None Corequisites: None Recommended Prerequisites: None Recommend Corequisites: None	
<b>Practicum in Energy*</b> 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	
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 Recommend 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 Recommend Corequisites: None	

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

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

[LEA name] does not discriminate on the basis of race, color, national origin, sex, or disability in its programs or activities and provides equal access to the Boy Scouts and other designated youth groups. The following person has been designated to handle inquiries regarding the nondiscrimination policies: [title], [address], [telephone number], [email]. Further nondiscrimination information can be found at <u>Notification of Nondiscrimination in Career and Technical Education Programs</u>.