# Scope & Sequence

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| Course Name: Oil and Gas Production I **TSDS PEIMS Code:** 13001250 | **Course Credit:** 1.0**Course Requirements:** Recommended for Grades 9-12. **Prerequisites:** None. |
| **Course Description:** In Oil and Gas Production I, students will identify specific career opportunities, skills, abilities, tools, certification, and safety measures associated with each career. Students will also understand components, systems, equipment, production and safety regulations associated with oil and gas wells. |
| **NOTE:** This is a suggested scope and sequence for the course content. This content will work with any textbook or instructional materials. If locally adapted, make sure all TEKS are covered. |
| **Total Number of Periods****Total Number of Minutes****Total Number of Hours** | 175 Periods7,875 Minutes131.25 Hours\* | \*Schedule calculations based on 175/180 calendar days. For 0.5 credit courses, schedule is calculated out of 88/90 days. Scope and sequence allows additional time for guest speakers, student presentations, field trips, remediation, extended learning activities, etc. |
| **Unit Number, Title, and Brief Description** | **# of Class Periods\***(assumes 45-minute periods)Total minutes per unit | **TEKS Covered****130.13. (c) Knowledge and skills** |
| **Unit 1: Professional Standards/Employability Skills**Students will discuss the professional standards and employability skills, including identifying career development and entrepreneurship opportunities in the oil and gas production field, applying competencies related to resources, information, interpersonal skills, problem solving, critical thinking, and systems of operation. Students will further develop and demonstrate these skills and attributes throughout the course. In small groups and/or in other classroom activities, students will demonstrate knowledge of personal and occupational safety, environmental regulations, and first-aid policy in the workplace, identify appropriate work habits, ethical conduct and legal responsibilities, and characteristics of good citizenship skills. Students will also demonstrate leadership skills to accomplish organizational goals and objectives.  | 20 periods900 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:(A) identify career development, education, and entrepreneurship opportunities in the oil and gas production field;(B) apply competencies related to resources, information, interpersonal skills, problem solving, critical thinking, and systems of operation;(C) demonstrate knowledge of personal and occupational safety, environmental regulations, and first-aid policy in the workplace;(D) analyze employers' expectations such as appropriate work habits, ethical conduct, legal responsibilities, and good citizenship skills; and(E) demonstrate leadership skills to accomplish organizational goals and objectives. |
| **Unit 2: Safety Issues**Students will discuss safety issues related to the oil and gas industry. In small groups and/or in other classroom activities, students will describe the safety, health, and environmental concerns associated with drilling, production, and maintenance. As a culminating activity to this unit, students will research safety standards in the petroleum industry such as the Bureau of Safety and Environmental Enforcement (BSEE), United States Coast Guard (USCG), American Petroleum Institute (API), Department of Transportation (DOT), Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), American Society for Testing and Materials (ASTM), American National Standards Institute (ANSI), and others. | 20 periods900 minutes | (5) The student discusses safety issues related to the oil and gas industry. The student is expected to:(A) describe the safety, health, and environmental concerns associated with drilling, production, and maintenance; and(B) research safety standards in the petroleum industry such as the Bureau of Safety and Environmental Enforcement (BSEE), United States Coast Guard (USCG), American Petroleum Institute (API), Department of Transportation (DOT), Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), American Society for Testing and Materials (ASTM), American National Standards Institute (ANSI), and others. |
| **Unit 3: History and Process**Students will discuss the history and process for drilling a well. In small groups and/or in other classroom activities, students will describe the history of drilling for petroleum in the United States and abroad, describe and appraise routine drilling operations, offshore drilling, and new drilling technologies, describe the tools and techniques for directional drilling, examine the differences between fishing, retrieving, and repairing pipe, describe the methods for completing a well in order for production to begin, assess fluid pressure, determine how the flow is initiated in a new well, differentiate between major components of a well and discuss the purpose, design, and operation of each component, describe activities associated with completing a well, describe the well completion processes and equipment, summarize the instruments and techniques used when logging and testing during the drilling and completion of a well, and list the factors that are analyzed when studying a poorly producing well. As a culminating activity for this unit, students will produce a report and presentation that identifies the responsibilities, characteristics, abilities, and work behaviors of personnel that are involved in well service. | 50 periods2,250 minutes | (3) The student understands the history and process for drilling a well. The student is expected to:(A) describe the history of drilling for petroleum in the United States and abroad;(B) describe and appraise routine drilling operations, offshore drilling, and new drilling technologies;(C) describe the tools and techniques for directional drilling;(D) examine the differences between fishing, retrieving, and repairing pipe;(E) describe the methods for completing a well in order for production to begin;(F) assess fluid pressure;(G) determine how the flow is initiated in a new well;(H) differentiate between major components of a well and discuss the purpose, design, and operation of each component;(I) describe activities associated with completing a well;(J) describe the well completion processes and equipment;(K) summarize the instruments and techniques used when logging and testing during the drilling and completion of a well;(L) list the factors that are analyzed when studying a poorly producing well; and(M) identify the responsibilities, characteristics, abilities, and work behaviors of personnel that are involved in well service. |
| **Unit 4: Components and Systems**Students will discuss and identify components, systems, equipment, production, and safety regulations associated with oil and gas wells. In small groups and/or in other classroom activities, students will identify the major systems and equipment used in the production of oil and gas, identify and describe the wellhead equipment that controls fluid flow, trace the process flow through the oil and gas production systems and equipment, discuss the purpose of the wellhead and identify the major components, describe the purpose, design, and operation of each wellhead component, compare and contrast the major differences in wellhead construction, compare and contrast onshore and offshore facilities, compare and contrast oil and gas regions within the United States, describe the safety, health, and environmental concerns associated with working around a wellhead, explain how the wellhead system affects other production systems tied to the wellhead, describe the activities associated with monitoring and regulating well flow, describe the wellhead maintenance activities performed by the production technician, and identify the operating conditions that would warrant a manual or automatic shut-in of a well and steps involved in a manual shut-in of a well. As a culminating activity for this unit, students will use appropriate technology and/or assigned materials to operate and troubleshoot a wellhead using a computer simulator, pilot plant, or tabletop unit.  | 50 periods2,250 minutes | (4) The student discusses and identifies components, systems, equipment, production, and safety regulations associated with oil and gas wells. The student is expected to:(A) identify the major systems and equipment used in the production of oil and gas;(B) identify and describe the wellhead equipment that controls fluid flow;(C) trace the process flow through the oil and gas production systems and equipment;(D) discuss the purpose of the wellhead and identify the major components;(E) describe the purpose, design, and operation of each wellhead component;(F) compare and contrast the major differences in wellhead construction;(G) compare and contrast onshore and offshore facilities;(H) compare and contrast oil and gas regions within the United States;(I) describe the safety, health, and environmental concerns associated with working around a wellhead;(J) explain how the wellhead system affects other production systems tied to the wellhead;(K) describe the activities associated with monitoring and regulating well flow;(L) describe the wellhead maintenance activities performed by the production technician;(M) operate and troubleshoot a wellhead using a computer simulator, pilot plant, or tabletop unit; and(N) identify the operating conditions that would warrant a manual or automatic shut-in of a well and steps involved in a manual shut-in of a well. |
| **Unit 5: Supervised Agriculture Experience Program**Students will discuss and develop all components of a supervised agriculture experience. Through a variety of classroom activities, students will utilize appropriate technology to plan, propose, conduct, document and evaluate their supervised agriculture experience program, apply appropriate record-keeping skills, and participate in leadership opportunities. As a culminating unit activity, students will produce and participate in a local program of activities using a strategic planning process. | 35 periods1,575 minutes | (2) The student develops a supervised agriculture experience program. The student is expected to:(A) plan, propose, conduct, document, and evaluate a supervised agriculture experience program as an experiential learning activity;(B) apply proper record-keeping skills as they relate to the supervised agriculture experience;(C) participate in youth leadership opportunities to create a well-rounded experience program; and(D) produce and participate in a local program of activities using a strategic planning process. |