# Scope & Sequence

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| Course Name: Energy and Power of Transportation Systems **TSDS PEIMS Code:** 13039300 | | | **Course Credit:** 1.0  **Course Requirements:** Recommended Grade Placement: 10 – 12.  **Recommended Prerequisites:** Principles of Transportation Systems. |
| **Course Description:** Energy and Power of Transportation Systems will prepare students to meet the expectations of employers in this industry and to interact and relate to others. Students will learn the technologies used to provide products and services in a timely manner. The businesses and industries of the Transportation, Distribution, and Logistics Career Cluster are rapidly expanding to provide new career and career advancement opportunities. Performance requirements will include academic and technical skills. Students will need to understand the interaction between various vehicle systems, including engines, transmissions, brakes, fuel, cooling, and electrical. Students will also need to understand the logistics used to move goods and services to consumers, as well as the components of transportation infrastructure. | | | |
| **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 Periods  7875 Minutes  131.25 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**  **130.460. (c) Knowledge and skills** | |
| **Unit 1: Career Exploration**  Students will expand their knowledge base and interest in careers and entrepreneurship opportunities in the transportation industry. Students will discuss and demonstrate appropriate and effective group participation and good citizenship in this and in all units as they develop personal and career goals and increase their interpersonal and leadership skills. Students will explore and discuss academic standards and certification requirements and opportunities as they develop their plans for successful careers. | 10 periods  450 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (A) demonstrate the principles of group participation and leadership related to citizenship and career preparation;  (C) identify career development, employment, and entrepreneurship opportunities and certification requirements for the field of energy and power of transportation systems;  (D) discuss certification requirements to meet state academic standards and qualifications for employment in selected fields of study; and  (F) identify opportunities for leadership development and personal growth. | |
| **Unit 2: Leadership and Teamwork Projects**  Students will demonstrate effective leadership development and teamwork skills as they create and/or participate in a variety of workplace scenarios that identify employer expectations, appropriate work habits, ethical decision-making, and the safe use of the hand and power tools commonly used in engine maintenance and repair. | 20 periods  900 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (A) demonstrate the principles of group participation and leadership related to citizenship and career preparation;  (B) identify employers' expectations and appropriate work habits;  (E) apply ethical reasoning to a variety of workplace scenarios in order to make ethical decisions;  (F) identify opportunities for leadership development and personal growth;  (G) describe and apply team dynamics principles in a project setting; and  (H) demonstrate effective oral and written communication skills with individuals from various cultures.  (2) The student knows the functions and applications of the tools, equipment, technologies, and materials used in the field of energy and power of transportation systems. The student is expected to:  (A) discuss the safe use of hand and power tools and equipment commonly used in the maintenance and repair of engines. | |
| **Unit 3: Maintenance and Service**  Students will explore, discuss, and describe major components in vehicular systems and identify necessary maintenance and service in simulated workplace situations. Students will be given multiple opportunities to describe, demonstrate and apply technical knowledge and skills in-context as they discuss preventative maintenance plans and systems. As they participate in unit activities, students should continue to be given opportunities to discuss and demonstrate the safe use of hand and power tools in context. | 25 periods  1125 minutes | (2) The student knows the functions and applications of the tools, equipment, technologies, and materials used in the field of energy and power of transportation systems. The student is expected to:  (A) discuss the safe use of hand and power tools and equipment commonly used in the maintenance and repair of engines.  (3) The student applies technical knowledge and skills to simulated situations. The student is expected to:  (A) identify the major components in a vehicular system;  (B) identify necessary maintenance and service of vehicular systems; and  (C) discuss preventative maintenance plans and systems to keep vehicular systems in operation. | |
| **Unit 4: Audits, Inspections, and Regulations**  Students will explore, discuss, and describe the use of audits and inspections to maintain compliance with safety, health, and environmental regulations in classroom activities, demonstrations, and/or simulated workplace situations. Students will be given multiple opportunities to describe, demonstrate and apply technical knowledge and skills in-context as they discuss and/or participate in related decision-making scenarios. As they participate in unit activities, students should continue to be given opportunities to discuss and demonstrate the safe use of hand and power tools in context. | 25 periods  1125 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (A) demonstrate the principles of group participation and leadership related to citizenship and career preparation;  (B) identify employers' expectations and appropriate work habits; and  (E) apply ethical reasoning to a variety of workplace scenarios in order to make ethical decisions.  (2) The student knows the functions and applications of the tools, equipment, technologies, and materials used in the field of energy and power of transportation systems. The student is expected to:  (A) discuss the safe use of hand and power tools and equipment commonly used in the maintenance and repair of engines; and  (B) discuss the use of audits and inspections to maintain compliance with safety, health, and environmental regulations.  (5) The student uses academic skills to document the requirements of the energy and power of transportation systems. The student is expected to:  (A) demonstrate communication skills related to working with customers, technicians, and others; and  (F) demonstrate knowledge of regulations that govern the construction, maintenance, and service of energy and power of transportation systems. | |
| **Unit 5: Measurements and Repairs**  Students will be given multiple opportunities to demonstrate their knowledge and technical skills with “hands-on” activities, presentations, discussions, and vehicle inspections in simulated or actual work situations. Students will also demonstrate academic, problem-solving, decision-making, and critical thinking skills as they perform precision measurements and read and interpret appropriate documents to diagnose vehicular system malfunctions and determine necessary repairs. As they participate in unit activities, students should continue to be given opportunities to discuss and demonstrate the safe use of hand and power tools in context. | 25 periods  1125 minutes | (2) The student knows the functions and applications of the tools, equipment, technologies, and materials used in the field of energy and power of transportation systems. The student is expected to:  (A) discuss the safe use of hand and power tools and equipment commonly used in the maintenance and repair of engines.  (5) The student uses academic skills to document the requirements of the energy and power of transportation systems. The student is expected to:  (C) read and interpret appropriate documents such as schematics, charts, diagrams, graphs, parts catalogs, and service-repair manuals and bulletins;  (D) perform precision measurements and use industry specifications to diagnose component shape and alignment issues and determine necessary repair; and  (E) use critical-thinking skills to diagnose vehicular system malfunctions, solve problems, and make decisions. | |
| **Unit 6:** **Transportation Systems: Past, Present, and Future**  Students will expand their understanding of the historical scope, impact, and significance of energy and power transportation systems and industries by reviewing and/or creating timelines that identify past and present events related to transportation. Students will explore, discuss, and describe how transportation and issues related to transportation affect individuals as well as societies, and explore how emerging technologies, environmental issues, international trade, globalization, employment issues, and safety could affect transportation systems in the future. Students will discuss in small groups and/or describe in illustrations or presentations potential future development scenarios and issues for the energy and power of transportation systems and industries. | 25 periods  1125 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (A) demonstrate the principles of group participation and leadership related to citizenship and career preparation;  (4) The student describes the historical, current, and future significance of the energy and power of transportation systems. The student is expected to:  (A) identify the scope and effect upon society of the energy and power of transportation systems; and  (B) identify potential future scenarios for the energy and power of transportation systems.  (5) The student uses academic skills to document the requirements of the energy and power of transportation systems. The student is expected to:  (A) demonstrate communication skills related to working with customers, technicians, and others; and  (F) demonstrate knowledge of regulations that govern the construction, maintenance, and service of energy and power of transportation systems. | |
| **Unit 7: People and Paperwork**  Students will be given multiple opportunities to learn and demonstrate the procedures for preparing quotes, work orders, invoices, reports and related paperwork for transportation systems in simulated and/or actual work situations. Students will also identify and apply the technical knowledge, mathematical skills, and other academic skills necessary to read and interpret schematics, diagrams, graphs, charts, catalogs, manuals, and examples of other documents and paperwork associated with transportation systems and services. Students will recognize and discuss the regulations that govern the construction, maintenance, and service of energy and power of transportation systems. | 25 periods  1125 minutes | (5) The student uses academic skills to document the requirements of the energy and power of transportation systems. The student is expected to:  (A) demonstrate communication skills related to working with customers, technicians, and others;  (B) prepare documentation such as quotes, invoices, bills of lading, work orders, and other reports;  (C) read and interpret appropriate documents such as schematics, charts, diagrams, graphs, parts catalogs, and service-repair manuals and bulletins; and  (F) demonstrate knowledge of regulations that govern the construction, maintenance, and service of energy and power of transportation systems. | |
| **Unit 8: Transportation Career Activities**  Students will participate in course culminating career activities which will include a demonstration of knowledge of regulations that govern the construction, maintenance, and service of energy and power of transportation services and an understanding of the use of audits and inspections to maintain compliance with safety, health, and environmental regulations.  Students will also participate in mock interviews both as applicants and as potential employers, and create and/or participate in various workplace scenarios that demonstrate appropriate workplace conduct, employer expectations, and interactions with colleagues and customers. As part of these interviews and scenarios, students will demonstrate effective leadership, group participation, teamwork, and communication skills. | 20 periods  900 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (A) demonstrate the principles of group participation and leadership related to citizenship and career preparation; and  (B) identify employers' expectations and appropriate work habits.  (2) The student knows the functions and applications of the tools, equipment, technologies, and materials used in the field of energy and power of transportation systems. The student is expected to:  (B) discuss the use of audits and inspections to maintain compliance with safety, health, and environmental regulations.  (5) The student uses academic skills to document the requirements of the energy and power of transportation systems. The student is expected to:  (A) demonstrate communication skills related to working with customers, technicians, and others; and  (F) demonstrate knowledge of regulations that govern the construction, maintenance, and service of energy and power of transportation systems. | |