# Scope & Sequence

|  |  |  |  |
| --- | --- | --- | --- |
| Course Name: Diesel Equipment Technology I **TSDS PEIMS Code:** 13040150 | | | **Course Credit:** 2.0  **Course Requirements:** Recommended Grade Placement: 9 – 12.  **Prerequisites:** None. |
| **Course Description:** Diesel Equipment Technology I includes knowledge of the function and maintenance of diesel systems. Rapid advances in diesel technology have created new career opportunities and demands in the transportation industry. This course provides the knowledge, skills, and technologies required for employment in transportation systems. | | | |
| **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** | 350 Periods  15,750 Minutes  262.50 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**  **130.458. (c) Knowledge and skills** | |
| **Unit 1: Professional Standards and Career Exploration**  Students will expand their knowledge base and interest in careers and entrepreneurship opportunities in diesel equipment technology industries. Students will discuss and demonstrate the principles of group participation and teamwork and effective and appropriate communication in this and in all units as they develop personal and career goals and increase their interpersonal skills. Students will explore and discuss employers’ expectations, workplace ethics, and industry-recognized certification opportunities and requirements as well as resources available through CTSO or other extracurricular organization(s) to further develop leadership and employability skills as they continue to develop their plans, goals, and objectives for future career and educational opportunities. | 10 periods  450 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (A) identify employment opportunities, including entrepreneurship opportunities, and certification requirements for the field of diesel technology;  (B) participate in group and leadership activities related to citizenship and career preparation;  (C) identify employers' expectations and appropriate work habits; and  (F) demonstrate workplace ethics in a variety of workplace scenarios. | |
| **Unit 2: Health and Safety**  Students will discuss and identify employers’ expectations regarding safe and appropriate work habits, ethical conduct, and necessary competencies in the transportation industries. Students will participate as a class and/or in small groups to model, present, and discuss health and safety scenarios and safety equipment in the workplace as well as response plans to potential emergency situations. Students will examine and discuss hydraulic/pneumatic properties, controls, and safety, and observe and discuss the proper handling and disposal of environmentally hazardous materials generated in the service of diesel equipment. Students will be given multiple “hands on” opportunities to observe, discuss, and demonstrate the safe and proper use of hand and power tools and other equipment commonly used in the diesel equipment field. | 30 periods  1,350 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (B) participate in group and leadership activities related to citizenship and career preparation;  (C) identify employers' expectations and appropriate work habits;  (D) identify the competencies related to resources, information systems, and technology as it pertains to diesel equipment technology;  (E) demonstrate knowledge and skills related to health and safety in the workplace; and  (F) demonstrate workplace ethics in a variety of workplace scenarios.  (4) The student learns the functions and applications of the tools, equipment, technologies, and materials used in diesel equipment service. The student is expected to:  (A) describe and demonstrate the safe use of hand and power tools and equipment commonly used in the diesel equipment field;  (B) discuss the proper handling and disposal of environmentally hazardous materials generated in the service of diesel equipment; and  (E) describe hydraulic/pneumatic properties, controls, and safety. | |
| **Unit 3: Academic and Communication Skills in Transportation Technology**  Students will explore, discuss, and demonstrate the academic and communication skills required for a successful career in transportation technology fields. Students will be given multiple opportunities to learn, demonstrate and apply relevant problem-solving, communication, and academic skills in-context as they demonstrate occupational tasks such as reading and interpreting service repair information, schematics, charts, diagrams, graphs, parts catalogs, and technical bulletins as well as performing precision measurements using both metric and U.S. standard measurement systems. Students will discuss and describe hydraulic/pneumatic properties, controls, and safety as well as new and emerging diesel technologies, and predict what other math, science, and other academic skills will be necessary for a successful career in diesel equipment technology and transportation-related fields. | 30 periods  1,350 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (C) identify employers' expectations and appropriate work habits; and  (D) identify the competencies related to resources, information systems, and technology as it pertains to diesel equipment technology.  (2) The student demonstrates academic skills related to the requirements of transportation technology. The student is expected to:  (A) demonstrate effective oral communication skills with individuals from various cultures such as fellow students, coworkers, and customers;  (B) demonstrate effective written communication skills with individuals from various cultures such as fellow students, coworkers, and customers; and  (C) demonstrate mathematical skills and precision measurements using the metric and U.S. standard systems.  (3) The student demonstrates technical knowledge and skills of diesel equipment technology. The student is expected to:  (C) locate, read, and interpret documents such as schematics, charts, diagrams, graphs, parts catalogs, and service-repair information and technical bulletins; and  (D) demonstrate precision measurement procedures to diagnose component wear, compare measurements to published specifications, and determine necessary repairs.  (4) The student learns the functions and applications of the tools, equipment, technologies, and materials used in diesel equipment service. The student is expected to:  (C) describe new and emerging diesel technologies; and  (E) describe hydraulic/pneumatic properties, controls, and safety. | |
| **Unit 4: Engine, Chassis, and Power Train**  After discussing and describing the major engine and chassis components of diesel powered vehicles, students will be given multiple opportunities to learn and demonstrate the technical knowledge, skills, and procedures for the removal, inspection, and replacement of engine components, and how to inspect and maintain chassis and power train systems in simulated and/or actual diesel technology work situations. Students will continue to be given multiple opportunities to safely demonstrate the proper use of tools, equipment, and materials in “hands-on” activities, presentations, discussions, and inspections in simulated or actual diesel technology work situations. | 45 periods  2,025 minutes | (3) The student demonstrates technical knowledge and skills of diesel equipment technology. The student is expected to:  (A) describe the function of the major components of diesel powered vehicles such as engines, fuel injection systems, lubrication, cooling, electrical, air-conditioning systems, air induction, exhaust, and emissions; and  (B) describe the function of the chassis components such as braking, steering, transmission, drivetrain, suspension systems, pneumatics, and hydraulics.  (4) The student learns the functions and applications of the tools, equipment, technologies, and materials used in diesel equipment service. The student is expected to:  (A) describe and demonstrate the safe use of hand and power tools and equipment commonly used in the diesel equipment field.  (5) The student applies the technical knowledge and skills of diesel equipment technology to simulated or actual work situations. The student is expected to:  (B) demonstrate procedures for removal, inspection, and replacement of engine components;  (G) demonstrate and apply the procedures to inspect and maintain chassis and power train systems; and  (H) demonstrate and apply the procedures to inspect and maintain cooling and lubrication systems. | |
| **Unit 5: Hydraulics**  Students will discuss hydraulic/pneumatic properties, controls, and safety and be given multiple opportunities to learn and demonstrate the technical knowledge, skills, and procedures for the inspection and maintenance of hydraulic/pneumatic systems. Students will continue to be given multiple opportunities to safely demonstrate the proper use of tools, equipment, and materials and to observe and discuss the proper handling and disposal of environmentally hazardous materials in “hands-on” activities, presentations, discussions, and inspections in simulated or actual diesel technology work situations. | 45 periods  2,025 minutes | (4) The student learns the functions and applications of the tools, equipment, technologies, and materials used in diesel equipment service. The student is expected to:  (A) describe and demonstrate the safe use of hand and power tools and equipment commonly used in the diesel equipment field;  (B) discuss the proper handling and disposal of environmentally hazardous materials generated in the service of diesel equipment; and  (E) describe hydraulic/pneumatic properties, controls, and safety.  (5) The student applies the technical knowledge and skills of diesel equipment technology to simulated or actual work situations. The student is expected to:  (C) describe procedures for inspection and maintenance of ancillary systems such as braking, steering, suspension, and hydraulic/pneumatic systems. | |
| **Unit 6: Brakes, Steering, and Suspension**  Students will be given multiple “hands-on” opportunities to discuss and describe procedures for inspection and maintenance of braking, steering, and suspension systems. Students will apply and explain their technical knowledge and skills in activities, discussions, and inspections and/or in simulated or actual diesel technology work task situations, as well as have opportunities to safely learn and demonstrate the proper use of tools, equipment, and materials related to the inspection and maintenance of braking, steering, and suspension systems. Students will also discuss and demonstrate an understanding of the process of performing regular audits and inspections to maintain compliance with appropriate regulations and the proper handling and disposal of environmentally hazardous materials. | 40 periods  1,800 minutes | (4) The student learns the functions and applications of the tools, equipment, technologies, and materials used in diesel equipment service. The student is expected to:  (A) describe and demonstrate the safe use of hand and power tools and equipment commonly used in the diesel equipment field; and  (B) discuss the proper handling and disposal of environmentally hazardous materials generated in the service of diesel equipment.  (5) The student applies the technical knowledge and skills of diesel equipment technology to simulated or actual work situations. The student is expected to:  (C) describe procedures for inspection and maintenance of ancillary systems such as braking, steering, suspension, and hydraulic/pneumatic systems; and  (I) demonstrate an understanding of the process to perform regular audits and inspections to maintain compliance with appropriate regulations in areas such as safety, health, emissions, and environmental protection. | |
| **Unit 7: Electronics**  Students will be given multiple opportunities to learn and demonstrate their knowledge of electrical circuits and circuit testing, wiring diagrams, batteries and charging and starting systems and Ohm’s Law with “hands-on” activities, demonstrations, presentations, discussions, and inspections in simulated or actual diesel technology work task situations. Students will also discuss and demonstrate an understanding of the process of performing regular audits and inspections to maintain compliance with appropriate regulations and learn and discuss parts management procedures such as ordering, stocking, and locating parts. | 40 periods  1,800 minutes | (2) The student demonstrates academic skills related to the requirements of transportation technology. The student is expected to:  (A) demonstrate effective oral communication skills with individuals from various cultures such as fellow students, coworkers, and customers; and  (C) demonstrate mathematical skills and precision measurements using the metric and U.S. standard systems.  (4) The student learns the functions and applications of the tools, equipment, technologies, and materials used in diesel equipment service. The student is expected to:  (A) describe and demonstrate the safe use of hand and power tools and equipment commonly used in the diesel equipment field; and  (B) discuss the proper handling and disposal of environmentally hazardous materials generated in the service of diesel equipment;  (5) The student applies the technical knowledge and skills of diesel equipment technology to simulated or actual work situations. The student is expected to:  (A) describe the parts management procedures such as ordering, stocking, and locating parts;  (D) demonstrate and apply the concepts of electrical circuit testing, including Ohm's law, voltage drop, resistance, amperage, and voltage, as related to batteries and charging and starting systems;  (E) demonstrate and apply the concepts of wiring diagrams and related symbols and series and parallel circuits; and  (I) demonstrate an understanding of the process to perform regular audits and inspections to maintain compliance with appropriate regulations in areas such as safety, health, emissions, and environmental protection. | |
| **Unit 8: Heating, Air Conditioning and Accessory Systems**  Students will be given multiple opportunities to safely demonstrate the proper use of tools, equipment, and materials related to heating, air conditioning, and accessory systems in “hands-on” activities, presentations, discussions, and inspections in simulated or actual diesel technology work situations. Students will apply their technical knowledge and skills to inspect and maintain air-conditioning, heating, and accessory systems. Students will also discuss and demonstrate an understanding of the process of performing regular audits and inspections to maintain compliance with appropriate regulations and the proper handling and disposal of environmentally hazardous materials. | 35 periods  1,575 minutes | (5) The student applies the technical knowledge and skills of diesel equipment technology to simulated or actual work situations. The student is expected to:  (A) describe the parts management procedures such as ordering, stocking, and locating parts;  (E) demonstrate and apply the concepts of wiring diagrams and related symbols and series and parallel circuits;  (F) discuss the proper procedures to inspect and maintain auxiliary systems such as air-conditioning, heating, and accessory systems; and  (I) demonstrate an understanding of the process to perform regular audits and inspections to maintain compliance with appropriate regulations in areas such as safety, health, emissions, and environmental protection. | |
| **Unit 9: Preventative Maintenance**  Students will be given multiple opportunities to describe the functions of the major chassis and engine components of diesel powered vehicles as well as demonstrate their knowledge of preventive maintenance with “hands-on” activities, demonstrations, and inspections in simulated or actual diesel technology work task situations. Students will successfully demonstrate an understanding of the process to perform regular audits and inspections to maintain compliance with appropriate regulations in areas such as safety, health, emissions, and environmental protection as well as identify and properly use diagnostic tools and equipment. Students will also locate, read, and interpret service repair information, and demonstrate precision measurement procedures to diagnose component wear, compare measurements to published specifications, and determine necessary repairs. | 45 periods  2,025 minutes | (3) The student demonstrates technical knowledge and skills of diesel equipment technology. The student is expected to:  (A) describe the function of the major components of diesel powered vehicles such as engines, fuel injection systems, lubrication, cooling, electrical, air-conditioning systems, air induction, exhaust, and emissions;  (B) describe the function of the chassis components such as braking, steering, transmission, drivetrain, suspension systems, pneumatics, and hydraulics;  (C) locate, read, and interpret documents such as schematics, charts, diagrams, graphs, parts catalogs, and service-repair information and technical bulletins; and  (D) demonstrate precision measurement procedures to diagnose component wear, compare measurements to published specifications, and determine necessary repairs.  (4) The student learns the functions and applications of the tools, equipment, technologies, and materials used in diesel equipment service. The student is expected to:  (A) describe and demonstrate the safe use of hand and power tools and equipment commonly used in the diesel equipment field; and  (D) identify and perform the use of diagnostic tools and equipment.  (5) The student applies the technical knowledge and skills of diesel equipment technology to simulated or actual work situations. The student is expected to:  (I) demonstrate an understanding of the process to perform regular audits and inspections to maintain compliance with appropriate regulations in areas such as safety, health, emissions, and environmental protection. | |
| **Unit 10: Demonstrating Technical Knowledge and Professional Standards**  Students will participate in course culmination activities which will include a demonstration of technical knowledge as well as effective communication skills. Students will explain the importance of performing regular audits and inspections as well as describe parts ordering, stocking, and locating procedures using appropriate catalogs and/or other relevant documents. Students will also participate in mock interviews both as job applicants and as potential employers, as well as create and/or participate in various workplace scenarios that demonstrate appropriate workplace conduct, employer expectations, and personal application of workplace ethics. As part of these mock interviews and workplace scenarios, students will demonstrate appropriate group participation, teamwork, and effective listening and communication skills. | 30 periods  1,350 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (B) participate in group and leadership activities related to citizenship and career preparation;  (C) identify employers' expectations and appropriate work habits; and  (F) demonstrate workplace ethics in a variety of workplace scenarios.  (2) The student demonstrates academic skills related to the requirements of transportation technology. The student is expected to:  (A) demonstrate effective oral communication skills with individuals from various cultures such as fellow students, coworkers, and customers; and  (B) demonstrate effective written communication skills with individuals from various cultures such as fellow students, coworkers, and customers.  (3) The student demonstrates technical knowledge and skills of diesel equipment technology. The student is expected to:  (C) locate, read, and interpret documents such as schematics, charts, diagrams, graphs, parts catalogs, and service-repair information and technical bulletins.  (5) The student applies the technical knowledge and skills of diesel equipment technology to simulated or actual work situations. The student is expected to:  (A) describe the parts management procedures such as ordering, stocking, and locating parts; and  (I) demonstrate an understanding of the process to perform regular audits and inspections to maintain compliance with appropriate regulations in areas such as safety, health, emissions, and environmental protection. | |