# Scope & Sequence

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| Course Name: Diesel Equipment Technology II **TSDS PEIMS Code:** 13040160 | | | **Course Credit:** 2.0  **Course Requirements:** Recommended Grade Placement: 10 – 12.  **Prerequisites:** Diesel Equipment Technology I. |
| **Course Description:** Diesel Equipment Technology II includes knowledge of the function, diagnosis, and service of diesel equipment systems. Rapid advances in diesel technology have created new career opportunities and demands in the transportation industry. This course provides the advanced 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**  **130.459. (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 Computer and Technology Student Organizations (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;  (D) apply the competencies related to resources, information systems, and technology as it pertains to diesel equipment technology; 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, 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) apply 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.  (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.  (4) The student demonstrates the application of the tools, equipment, technologies, and materials used in diesel equipment diagnosis, service, and repair. The student is expected to:  (A) demonstrate safe use of hand and power tools and equipment commonly employed in diesel equipment technology;  (B) demonstrate the proper handling and disposal of environmentally hazardous materials generated in the servicing of diesel equipment; and  (E) demonstrate knowledge of 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 | (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.  (4) The student demonstrates the application of the tools, equipment, technologies, and materials used in diesel equipment diagnosis, service, and repair. The student is expected to:  (C) describe emerging diesel technologies;  (D) perform the proper use of diagnostic tools and equipment; and  (E) demonstrate knowledge of 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:  (A) demonstrate parts inventory management such as ordering parts, stocking parts, and locating parts; and  (I) perform regular audits and inspections to maintain compliance with appropriate regulations in areas such as emissions, safety, health, and environmental protection. | |
| **Unit 4: Engine, Chassis, and Power Train**  After discussing and describing 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 and chassis components 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 and the proper handling and disposal of environmentally hazardous materials in hands-on activities and in simulated or actual diesel technology work task situations. | 45 periods  2,025 minutes | (3) The student demonstrates technical knowledge and skills of diesel equipment service and repair. The student is expected to:  (A) describe the function of the major components of diesel powered vehicles and equipment such as engines; fuel injection systems; lubrication, cooling, electrical, and air-conditioning systems; and air induction, exhaust, and emissions systems;  (B) perform system diagnostics and failure analyses;  (C) describe the function of the chassis components such as braking, steering, transmission, drivetrain, suspension systems, pneumatics, and hydraulics;  (D) diagnose, repair, and replace auxiliary equipment such as power take offs, hydraulic components, and pneumatic components;  (E) locate, read, and interpret documents such as schematics, charts, diagrams, graphs, parts catalogs, and service-repair information and technical bulletins; and  (F) perform precision measurements and use published specifications to diagnose component wear and determine necessary repair or replacement.  (4) The student demonstrates the application of the tools, equipment, technologies, and materials used in diesel equipment diagnosis, service, and repair. The student is expected to:  (A) demonstrate safe use of hand and power tools and equipment commonly employed in diesel equipment technology;  (B) demonstrate the proper handling and disposal of environmentally hazardous materials generated in the servicing of diesel equipment; and  (D) perform the proper 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:  (A) demonstrate parts inventory management such as ordering parts, stocking parts, and locating parts;  (B) demonstrate procedures for the diagnosis, removal, repair, and replacement of engine components such as cylinder heads, engine blocks, timing components, crankshafts, intake and exhaust systems, and ancillary and auxiliary systems;  (F) diagnose, service, and repair chassis and power train systems;  (G) service and repair cooling and lubrication systems such as water pumps, oil pumps, radiators, and oil coolers;  (H) use appropriate diagnostic equipment on various diesel equipment systems; and  (I) perform regular audits and inspections to maintain compliance with appropriate regulations in areas such as emissions, safety, health, and environmental protection. | |
| **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 | (3) The student demonstrates technical knowledge and skills of diesel equipment service and repair. The student is expected to:  (B) perform system diagnostics and failure analyses;  (C) describe the function of the chassis components such as braking, steering, transmission, drivetrain, suspension systems, pneumatics, and hydraulics; and  (D) diagnose, repair, and replace auxiliary equipment such as power take offs, hydraulic components, and pneumatic components.  (4) The student demonstrates the application of the tools, equipment, technologies, and materials used in diesel equipment diagnosis, service, and repair. The student is expected to:  (A) demonstrate safe use of hand and power tools and equipment commonly employed in diesel equipment technology;  (B) demonstrate the proper handling and disposal of environmentally hazardous materials generated in the servicing of diesel equipment;  (D) perform the proper use of diagnostic tools and equipment; and  (E) demonstrate knowledge of 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:  (A) demonstrate parts inventory management such as ordering parts, stocking parts, and locating parts;  (C) diagnose, service, and repair diesel equipment systems such as braking, steering, suspension, pneumatic, and hydraulic systems;  (H) use appropriate diagnostic equipment on various diesel equipment systems; and  (I) perform regular audits and inspections to maintain compliance with appropriate regulations in areas such as emissions, safety, health, and environmental protection. | |
| **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. | 45 periods  2,025 minutes | (3) The student demonstrates technical knowledge and skills of diesel equipment service and repair. The student is expected to:  (B) perform system diagnostics and failure analyses;  (C) describe the function of the chassis components such as braking, steering, transmission, drivetrain, suspension systems, pneumatics, and hydraulics;  (E) locate, read, and interpret documents such as schematics, charts, diagrams, graphs, parts catalogs, and service-repair information and technical bulletins; and  (F) perform precision measurements and use published specifications to diagnose component wear and determine necessary repair or replacement.  (4) The student demonstrates the application of the tools, equipment, technologies, and materials used in diesel equipment diagnosis, service, and repair. The student is expected to:  (A) demonstrate safe use of hand and power tools and equipment commonly employed in diesel equipment technology;  (B) demonstrate the proper handling and disposal of environmentally hazardous materials generated in the servicing of diesel equipment; and  (D) perform the proper 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:  (A) demonstrate parts inventory management such as ordering parts, stocking parts, and locating parts;  (C) diagnose, service, and repair diesel equipment systems such as braking, steering, suspension, pneumatic, and hydraulic systems;  (H) use appropriate diagnostic equipment on various diesel equipment systems; and  (I) perform regular audits and inspections to maintain compliance with appropriate regulations in areas such as emissions, safety, health, and environmental protection. | |
| **Unit 7: Electronic Systems**  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 demonstrate the proper handling and disposal of environmentally hazardous materials. Students will safely use tools and appropriate diagnostic equipment, diagnose and repair electrical and electronic systems, and learn and discuss parts management procedures such as ordering, stocking, and locating electronic parts. | 40 periods  1,800 minutes | (2) The student demonstrates academic skills related to the requirements of transportation technology. The student is expected to:  (C) demonstrate mathematical skills and precision measurements using the metric and U.S. standard systems.  (4) The student demonstrates the application of the tools, equipment, technologies, and materials used in diesel equipment diagnosis, service, and repair. The student is expected to:  (A) demonstrate safe use of hand and power tools and equipment commonly employed in diesel equipment technology;  (B) demonstrate the proper handling and disposal of environmentally hazardous materials generated in the servicing of diesel equipment; and  (D) perform the proper 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:  (A) demonstrate parts inventory management such as ordering parts, stocking parts, and locating parts;  (D) diagnose and repair electrical and electronic systems such as starting, charging, lighting, computer controls, and on board diagnostics systems and components such as modules, solenoids, sensors, actuators, relays, and switches;  (H) use appropriate diagnostic equipment on various diesel equipment systems; and  (I) perform regular audits and inspections to maintain compliance with appropriate regulations in areas such as emissions, safety, health, 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 | (3) The student demonstrates technical knowledge and skills of diesel equipment service and repair. The student is expected to:  (A) describe the function of the major components of diesel powered vehicles and equipment such as engines; fuel injection systems; lubrication, cooling, electrical, and air-conditioning systems; and air induction, exhaust, and emissions systems;  (B) perform system diagnostics and failure analyses;  (E) locate, read, and interpret documents such as schematics, charts, diagrams, graphs, parts catalogs, and service-repair information and technical bulletins; and  (F) perform precision measurements and use published specifications to diagnose component wear and determine necessary repair or replacement.  (4) The student demonstrates the application of the tools, equipment, technologies, and materials used in diesel equipment diagnosis, service, and repair. The student is expected to:  (A) demonstrate safe use of hand and power tools and equipment commonly employed in diesel equipment technology;  (B) demonstrate the proper handling and disposal of environmentally hazardous materials generated in the servicing of diesel equipment; and  (D) perform the proper 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:  (A) demonstrate parts inventory management such as ordering parts, stocking parts, and locating parts;  (E) demonstrate an understanding of the diagnosis, service, and repair of air-conditioning, heating, and accessory systems;  (H) use appropriate diagnostic equipment on various diesel equipment systems; and  (I) perform regular audits and inspections to maintain compliance with appropriate regulations in areas such as emissions, safety, health, and environmental protection. | |
| **Unit 9: Preventative Maintenance**  Students will be given multiple opportunities to perform system diagnostics and use appropriate diagnostic equipment on various diesel equipment systems, perform regular audits and inspections and participate in diagnosing, servicing and repairing various diesel equipment systems and components with hands-on activities and demonstrations in simulated or actual diesel technology work task situations. Students will successfully demonstrate an understanding of preventive maintenance and regular audits and inspections to maintain compliance with appropriate regulations and demonstrate precision measurement procedures to diagnose component wear, compare measurements to published specifications, and determine necessary repairs. Students will also discuss and explain parts inventory management as well as how to locate, read, and interpret service repair information and other relevant materials and documentation. | 50 periods  2,250 minutes | (3) The student demonstrates technical knowledge and skills of diesel equipment service and repair. The student is expected to:  (B) perform system diagnostics and failure analyses;  (D) diagnose, repair, and replace auxiliary equipment such as power take offs, hydraulic components, and pneumatic components;  (E) locate, read, and interpret documents such as schematics, charts, diagrams, graphs, parts catalogs, and service-repair information and technical bulletins; and  (F) perform precision measurements and use published specifications to diagnose component wear and determine necessary repair or replacement.  (4) The student demonstrates the application of the tools, equipment, technologies, and materials used in diesel equipment diagnosis, service, and repair. The student is expected to:  (A) demonstrate safe use of hand and power tools and equipment commonly employed in diesel equipment technology;  (B) demonstrate the proper handling and disposal of environmentally hazardous materials generated in the servicing of diesel equipment; and  (D) perform the proper 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:  (A) demonstrate parts inventory management such as ordering parts, stocking parts, and locating parts;  (C) diagnose, service, and repair diesel equipment systems such as braking, steering, suspension, pneumatic, and hydraulic systems;  (D) diagnose and repair electrical and electronic systems such as starting, charging, lighting, computer controls, and on board diagnostics systems and components such as modules, solenoids, sensors, actuators, relays, and switches;  (E) demonstrate an understanding of the diagnosis, service, and repair of air-conditioning, heating, and accessory systems;  (F) diagnose, service, and repair chassis and power train systems;  (H) use appropriate diagnostic equipment on various diesel equipment systems; and  (I) perform regular audits and inspections to maintain compliance with appropriate regulations in areas such as emissions, safety, health, 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 inventory management processes such as ordering parts, stocking parts and locating parts by using appropriate catalogs and/or other relevant materials. 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. | 20 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) apply the competencies related to resources, information systems, and technology as it pertains to diesel equipment technology; 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.  (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) demonstrate parts inventory management such as ordering parts, stocking parts, and locating parts; and  (I) perform regular audits and inspections to maintain compliance with appropriate regulations in areas such as emissions, safety, health, and environmental protection. | |