

**GREAT PLAINS TECHNOLOGY CENTER
COURSE OF STUDY**

<u>Career Cluster:</u>	Transportation, Distribution & Logistics (TR)
<u>Career Pathway:</u>	Medium/Heavy Diesel Truck Repair (TR010)
<u>Career Major:</u>	Medium/Heavy Diesel Truck Service & Light Repair Technician (TR0100003)
<u>Career Major Hours:</u>	Secondary Students: 1050 Hours Adult Students: 1050 Hours
<u>Instructor:</u>	Name: Eric Alexander Office Number: (580) 250-5617 E-Mail Address: ealexander@greatplains.edu
<u>Academic Credit:</u>	Secondary Students: 3 high school credits per year Adult Students: Transcript
<u>Prerequisites:</u>	None

Career Major Description:

Students will cover safety and tools and equipment operation for the repair industry. They will learn about electrical theory, Digital Volt Ohm Meter (DVOM) usage, electrical system repairs, brake systems, engine, air conditioning system, steering and suspension system and the drive train. Students will also learn about the preventative maintenance inspection and performance procedures, regulations, and documentation.

Career Major Goals:

Students enrolled in this career major will be given the opportunity to develop the skills and attitudes needed to successfully enter the Diesel Mechanics Field according to their personal choice, ability, and resourcefulness. Career majors covered provide a variety of career goals or continuing education in transportation, distribution and logistics.

Upon achieving the goals of this career major, students should:

- Become competent in the fundamental entry-level skills of the medium/heavy truck technician, engine technician and preventive maintenance technician's needs
- Demonstrate and maintain good work ethics and behavior
- Demonstrate productive study and work habits
- Work as a team member
- Pass at least one Occupational State of Oklahoma certification area
- Become qualified for further related education and/or enter the job market
- Demonstrate independence in using problem solving and critical thinking techniques in completing all work assignments
- Develop the ability to work with limited or no supervision
- Accept and abide by the rules and regulations established by the school program and/or place of employment

Related Career Opportunities:

- Diesel Engine Technician Apprentice
- Preventive Maintenance Technician Apprentice

Career Major Objectives:

After successful completion of this career major, the student will be able to:

- Develop a resume, list of references, cover letter, and an achievement portfolio for future employment and educational purposes
- Apply and maintain a safe and healthy personal and work environment
- Demonstrate proper use of various tools and shop equipment used in the mechanics field
- Perform preventive maintenance inspections
- Perform diesel engine maintenance
- Troubleshoot and repair brake system failures
- Troubleshoot, isolate, and repair electrical/electronic system failures
- Troubleshoot and repair suspension and steering systems

Career Major Course Sequence:

- HS Student and Part-time Adult (Year One): Course Sequence I
- HS Student and Part-time Adult (Year Two): Course Sequence II
- Full-time Adult: Course Sequence I and II

**DESCRIPTION OF COURSES
SEQUENCE I**

<u>Course #</u>	<u>Course Name</u>	<u>HST</u>	<u>HSL</u>	<u>ADT</u>	<u>ADL</u>
TI00379	Introduction and Orientation to Diesel Technology	15	15	15	15
This course will cover the basic personal and shop safety used in the industry, this will also include hazardous material handling and storage. In this course, the student will learn to identify, use and care for hand and power tools commonly found in the diesel repair industry. The student will cover the basic scope of the diesel industry and the basic components and systems found within this industry. Students will cover basic movement and parking procedures of vehicles and equipment. Students will learn about the history of the industry and explore opportunities in careers and employment in dealerships and independent shops, from maintenance to major overhaul.					
TI00890	Diesel Electricity Introduction	30	30	30	30
In this course, students learn about magnetism, basic electrical circuits, and schematics. They will use Ohm's Law to solve problems, test and replace defective fuses, fusible links, circuit breakers, relays and solenoids. Electrical meters will be used to check applied voltages current flow, resistance, and to find shorts and grounds.					
TI00056	Preventive Maintenance Inspection	30	30	30	30
This course teaches students the importance of a good preventive maintenance program, the various inspection procedures, federal regulations to be followed, and the necessity of keeping correct documentation.					
TI00329	Medium Heavy Truck Brakes	50	55	50	55
Students are taught the operation of air brake systems and brake hydraulic systems. Problem-solving techniques and repair procedures for these systems and related components are covered in this course.					

TI00167 Diesel Electricity Fundamentals 65 70 65 70
 This course takes students to a higher level of diagnosis and repair on electrical systems. Students will perform Automotive Service Excellence (ASE) tasks on the battery system, starter system, charging system, and ignition system. They will identify oscilloscope patterns and troubleshoot electronic ignition components.

TI00019 Diesel Electricity Advanced 30 15 30 15
 Students are taught the evolution of electronics as it pertains to the diesel industry. They will learn the advantages of integrated circuits over transistorized circuits, and use test equipment to check continuity in electronic circuits. Students will also interface with vehicle's on-board computer and perform diagnostic procedures to determine needed repairs.

TI00021 Medium/Heavy Diesel Truck Heating and Air Conditioning Introduction 10 35 10 35
 This course will include general A/C systems, compressor and clutches, evaporator, condenser and related components. Students will learn to verify the need for service and to inspect and change out major system components, check and adjust lubricant levels. Students will learn to handle, store and identify refrigerant and how to operate a reclaiming/charging station.

TI00059 Medium/Heavy Diesel Truck Heating and Air Conditioning Advanced 10 35 10 35
 This course will cover the heating, ventilation and air conditioning system diagnosis, service and repair. This course will help to develop techniques to troubleshoot electrical, vacuum and mechanical system failures related to the heating, ventilation and air conditioning system. Also included in this course, the student will learn to inspect, test, diagnose and service the engine cooling system components.

Sequence I Subtotal Hours:	Theory	Lab	Total
High School Student:	240	285	525
Adult Student:	240	285	525

**DESCRIPTION OF COURSES
SEQUENCE II**

Course #	Course Name	HST	HSL	ADT	ADL
TI01386	Introduction to Computers and Applications	15	30	15	30
This hands-on course provides students with a basic understanding of computers and their application. Students will be able to demonstrate on an introductory level the use of a computer operating system, an office suite and productivity tools as well as the Internet.					
TI00752	Transportation, Service Management, Operation & Supervision	20	40	20	40
In this course the student will learn about the types of service facilities and the roles of the service consultant. The student will learn about the team approach, what the responsibilities of the team leader are, optional team formats, member assignments and how a team approach can provide superior customer service. This course will cover the internal communications, relations and supervision, as well as workflow development. This course will explain other duties for general operation practices such as making the sale, making sublet and up sales, business contracts, facility maintenance contracts, internal					

services, liability insurance and workers' compensation. The student will also learn to present and prioritize service needs and explain related and additional services and their value. Also covered in this course will be ways to develop and maintain a positive work environment.

TI00057 Preventive Maintenance Service 25 50 25 50

In this course, students will perform preventative maintenance on the electrical/electronic systems, brake system, drive train, suspension and steering system, tires and wheels.

TI00891 Medium/Heavy Truck Steering and Suspension 50 55 50 55

In this course students will identify and describe various steering systems used on diesel-powered vehicles and have an opportunity to inspect, diagnose, and repair steering problems. They will also make needed repairs on the suspension system and perform wheel alignments.

TI00328 Diesel Engine Systems 10 35 10 35

In this course students are taught about the various lubricants used in diesel engines and equipment, how to perform oil and filter changes, identify and inspect components of the cooling system and possible causes of engine overheating, inspect, diagnosis and repair of the air flow system and fuel system.

TI00166 Diesel Engine Specialization 70 95 70 95

Students will disassemble, repair and reassemble a diesel engine. Necessary engine measurements will be taken as students diagnose and repair the cylinder heads, valve train, cylinder block, crankshaft and related components. This course covers the fundamentals and construction of diesel engines and related components, how to service and repair diesel engines diagnose causes of engine fuel, oil, coolant, air leaks, engine noises vibrations, and determine needed repairs.

TI00802 Workforce Staging 0 30 0 30

This course is designed to be delivered as an integrated component within the courses taken by the individual student. The course is designed for the development of leadership, personal development and employability skills.

Sequence II Subtotal Hours:	Theory	Lab	Total
High School Student:	190	335	525
Adult Student:	190	335	525

Career Major Total:	Theory	Lab	Total
High School Student:*	430	620	1050
Adult Student:	430	620	1050

* High school students may complete this career major in an adult enrollment status if necessary. Please see your instructor or counselor for details.

Evaluation Policy:

Employability Grades (100 points per week; 50% of final grade)

The employability skills grade is based on 20 points per day (which may include: attitude, attendance, safety, punctuality, cooperation, participation, clean-up, class preparation,

school/classroom rules, and time management). Points will be deducted if these responsibilities are not met at the instructor's discretion. Students will be allowed to make up unearned employability points for **excused** absences only. Full credit will be given for assignments/tests that have been made up due to excused absences only (see Student Handbook).

Performance Grades (20% of final grade)

- Live projects
- Performance or skill tests
- Homework
- Written Assignments

Test Grades (30% of final grade)

- Test grades will be based on a 100-point scale.
- Test grades include written and/or skills tests.
- A test will be given for each unit of instruction.
- Tests are to be taken as a unit is completed.
- Tests must be completed within allotted time.

Final Grade (9 Weeks Period)

9-weeks grade will be calculated by averaging grades in each category and summing each category according to their assigned weight. Progress reports will be sent to home schools at six and twelve-week intervals each semester as required or requested. Grades are accessible on-line at <http://sonisweb.greatplains.edu/studsect.cfm>

Grading Scale:

The grading scale as adopted by the Board of Education is as follows:

- A = 90 – 100
- B = 80 – 89
- C = 70 – 79
- D = 60 – 69
- F = Below 60
- W = Withdrawn
- I = Incomplete
- N = No Grade (Refer to Student Handbook)

Make-Up Work Policy:

All Make-Up Work Is The Responsibility Of The Student. Make-up work will be handled as specified in the Student Handbook. Please be sure to read and understand all student policies, especially make-up of assignments, tests and employability due to absences. Students should always arrange for any make-up work with the instructor as per the Student Handbook. Students should keep track of his or her progress and grades.

Attendance Policy:

For specific information related to attendance and tardiness refer to the Student Handbook. Students should keep a written record of their absences and tardiness.

Course Requirements and Expectations:

The general course requirements and expectations include:

- Teaching methods consist of lecture and “hands on” projects.

- The student must demonstrate the ability to apply safety to all aspects of the mechanic field.
- It is recommended that the student meet with their teacher and parents at least once per semester.
- All students must adhere to the policies and procedures in the GPTC Student Handbook.
- SkillsUSA is the student organization for the medium/heavy truck mechanic field. This club offers an outstanding opportunity to develop leadership and social skills. Students are highly encouraged to participate.
- It is highly recommended that the student have purchased or attained the required tools and equipment for employment as a technician. Possessing a valid driver's license will also benefit the student and is recommended.
- GPTC has partnered with area state colleges and universities to award college credit to students who are enrolled in certain GPTC programs. Students can earn college credits from Western Oklahoma State College, or OSU-IT for completing the Medium/Heavy Truck Mechanic program. Students are encouraged to take advantage of these cooperative agreements.
- Students should dress and groom appropriately for the job they are being trained.

Student Behavior Includes:

- All students will wear navy-blue coveralls.
- Coveralls will be worn from the beginning of the class period to the end of the class period, or until shop cleanup is finished. This includes during any period of time when a student may be out of the Shop or Classroom 131 to include break periods.
- Coveralls will be worn properly and not tied around the waist at any time. Coveralls must fit properly or be replaced.
- Coveralls in need of repair will be fixed within three days or replaced.
- Students may not alter their coveralls in any way without the specific permission of the instructor and should never leave the program.
- Safety precautions prohibit the wearing of shorts, tank tops, sleeveless shirts and visible body piercings. Full length pants are to be worn as this is a working environment.
- Students will also be expected to wear their student ID badge on their left breast pocket any time they are on campus this includes break times.
- Student ID badges will not be altered in any way or they will be required to purchase a new one.
- Students will wear shoes that completely cover the feet and laced properly.
- Students will wear clear safety glasses at all times while in the shop environment and may not be altered without specific permission of the instructor. Clear prescription glasses will be permitted.

These rules are in addition to the Student Handbook. Students will be provided a wall-locker and lock to secure all items.

NOTE: For additional information or questions regarding the GPTC School policies and procedures, please refer to the Student Handbook and/or the Instructor.

Industry Alignments:

- National Automotive Technicians Education Foundation (NATEF)

Certification Outcomes:

Tier 1 – Certifications Recognized, Administered and/or Endorsed by Industry

- ASE: MHT: STUDENT: Brakes (2263)
- ASE: MHT: STUDENT: Diesel Engines (2260)
- ASE: MHT: STUDENT: Electrical/Electronic Systems (2261)

- ASE: MHT: STUDENT: Suspension & Steering (2262)

Tier 2 – Certifications Endorsed by Industry Organizations

- ODCTE: Diesel Engine Repair Technician (2151)
- ODCTE: Preventive Maintenance Inspection Technician (2152)
- ODCTE: Electrical Systems Repair Technician (2153)
- ODCTE: Brakes Technician (2154)
- ODCTE: HVAC Repair Technician (2156)

Tier 7 – National Career Readiness Certificate in Applied Mathematics, Locating Information and Reading for Information:

- Platinum Level – 6 or above in all three areas
- Gold Level – 5 or above in all three areas
- Silver Level – 4 or above in all three areas
- Bronze Level – 3 or above in all three areas

CIP Code and SOC Code Crosswalk:

- CIP Code – 47.0613
- SOC Code – 49-3031.00

Instructional Materials:

Students are not required to purchase textbooks or supplemental materials.

Textbooks:

Duffy, Owen C., and Gus Wright. Fundamentals of Medium/Heavy Duty Commercial Vehicle Systems Textbook. 978-1-284-04116-3. Burlington: Jones & Bartlett Learning, 2016

Norman, Andrew. Diesel Technology Textbook Fundamentals, Service, Repair. 8th ed. 978-1-61960-832-0. Tinley Park: Goodheart-Wilcox Company, 2016.

Norman, Andrew. Diesel Technology Workbook Fundamentals, Service, Repair. 8th ed. 978-1-61960-835-1. Tinley Park: Goodheart-Wilcox Company, 2016.

eLearning Curriculum:

CDX Automotive. "CDX Heavy Vehicle." *hv.gptc.cdbsite.com*. Burlington: Jones and Bartlett Learning LLC., 2012. Web. < <http://hv.gptc.cdbsite.com>>