# MEDIUM/HEAVY DIESEL TRUCK HEATING & AIR CONDITIONING ADVANCED
## Course Syllabus

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<tr>
<th>Course Number:</th>
<th>TRUK-0059</th>
<th>OHLAP Credit:</th>
<th>No</th>
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<tbody>
<tr>
<td>OCAS Code:</td>
<td>None</td>
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<tr>
<td>Course Length:</td>
<td>45 Hours</td>
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<td>Career Cluster:</td>
<td>Transportation, Distribution, and Logistics</td>
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<tr>
<td>Career Pathway:</td>
<td>Medium/Heavy Diesel Truck Repair</td>
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<td>Career Major(s):</td>
<td>Diesel Service Technician</td>
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**Pre-requisite(s):**
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.

**Course Description:**
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.

**Textbooks/Materials:**
- PTTTS Truck Web-Bases Training Online Courses

**Course Objectives:**

### A. HVAC Systems Diagnosis, Service, and Repair.

1. Verify the need for service or repair of HVAC systems based on unusual operating noises; determine needed action. (P1-VI.A.1)
2. Verify the need for service or repair of HVAC systems based on unusual visual, smell, and touch conditions; determine needed action. (P1-VI.A.2)
3. Identify system type and components (cycling clutch orifice tube – CCOT, expansion valve) and conduct performance test(s) on HVAC systems; determine needed action. (P1-VI.A.3)

### B. Operating Systems and Related Controls Diagnosis and Repair; Electrical.

1. Diagnose the cause of failures in HVAC electrical control systems; determine needed action. (P1-VI.D.1.1)
2. Inspect and test A/C heater blower motors, resistors, switches, relays, modules, wiring, and protection devices; determine needed action. (P2-VI.D.1.2)
3. Inspect and test A/C compressor clutch relays, modules, wiring, sensors, switches, diodes, and protection devices; determine needed action. (P2-VI.D.1.3)
4. Inspect and test A/C-related electronic engine control systems; determine needed action. (P2-VI.D.1.4)
5. Inspect and test engine cooling/condenser fan motors, relays, modules, switches, sensors, wiring, and protection devices; determine
needed action. (P2-VI.D.1.5)
6. Inspect and test electric actuator motors, relays/modules, switches, sensors, wiring, and protection devices; determine needed action. (P3-VI.D.1.6)
7. Inspect and test HVAC system electrical control panel assemblies; determine needed action. (P3-VI.D.1.7)

C. Operating Systems and Related Controls Diagnosis and Repair; Air/Vacuum/Mechanical.
1. Diagnose the cause of failures in HVAC air, vacuum, and mechanical switches and controls; determine needed action. (P1-VI.D.2.1)
2. Inspect and test HVAC system air/vacuum/mechanical control panel assemblies; determine needed action. (P3-VI.D.2.2)
3. Inspect, test, and adjust HVAC system air/vacuum/mechanical control cables and linkages; determine needed action. (P3-VI.D.2.3)
4. Inspect and test HVAC system vacuum actuators (diaphragms/motors) and hoses; determine needed action. (P3-VI.D.2.4)
5. Inspect and test HVAC system vacuum reservoir(s), check valve(s), and restrictors; determine needed action. (P3-VI.D.2.5)
6. Inspect, test, and adjust HVAC system ducts, doors, and outlets; determine needed action. (P3-VI.D.2.6)

D. Heating and Engine Cooling Systems Diagnosis, Service, and Repair.
1. Diagnose the cause of outlet air temperature control problems in the HVAC system; determine needed action. (P1-VI.C.1)
2. Diagnose window fogging problems; determine needed action. (P2-VI.C.2)
3. Perform engine cooling system tests for leaks, protection level, contamination, coolant level, coolant type, temperature, and conditioner concentration; determine needed action. (P1-VI.C.3)
4. Inspect engine cooling and heating system hoses, lines, and clamps; determine needed action. (P1-VI.C.4)
5. Inspect and test radiator, pressure cap, and coolant recovery system (surge tank); determine needed action. (P1-VI.C.5)
6. Inspect water pump for leaks and bearing play; determine needed action. (P2-VI.C.6)
7. Inspect and test thermostats, by-passes, housings, and seals; determine needed repairs. (P2-VI.C.7)
8. Recover, flush, and refill with recommended coolant/additive package; bleed cooling system. (P1-VI.C.8)
9. Inspect thermostatic cooling fan system (hydraulic, pneumatic, and electronic) and fan shroud; replace as needed. (P2-VI.C.9)
10. Inspect and test heating system coolant control valve(s) and manual shut-off valves; determine needed action. (P2-VI.C.10)
11. Inspect and flush heater core; determine needed action. (P2-VI.C.11)

1 ODCTE Objective
Coding indicates NATEF alignment.
All unmarked objectives are TTC instructor developed.
Teaching Methods: The class will primarily be taught by the lecture and demonstration method and supported by various media materials to address various learning styles. There will be question and answer sessions over material covered in lecture and media presentations. Supervised lab time is provided for students to complete required projects.

Grading Procedures: 1. Students are graded on theory and shop practice and performance. 2. Each course must be passed with seventy (70%) percent or better. 3. Grading scale: A=90-100%, B=80-89%, C=70-79%, D=60-69%, F=50-59%.

Description of Classroom, Laboratories, and Equipment: Tulsa Technology Center campuses are owned and operated by Tulsa Technology Center School District No. 18. All programs provide students the opportunity to work with professionally certified instructors in modern, well-equipped facilities.

Available Certifications/College Credit: The student may be eligible to take state, national or industry exam after completion of the program. College credit may be issued from Oklahoma State University-Okmulgee or Tulsa Community College. See program counselor for additional information.

College Credit Eligibility: The student must maintain a grade point average of 2.0 or better.