



Western Technical College

32412321 HVAC - Diesel

Course Outcome Summary

Course Information

Description	A practical study of the theories and maintenance procedures for the operation, preventive maintenance, failure diagnosis and repair of cab climate control systems. The EPA and industry required practices will be adhered to throughout the course.
Career Cluster	Transportation, Distribution and Logistics
Instructional Level	Two-Year Technical Diploma
Total Credits	2
Total Hours	72

Pre/Corequisites

Prerequisite	32412400 Diesel Truck Preventive Maintenance
Prerequisite	32412401 Diesel Truck Powertrains
Prerequisite	32412351 Diesel Truck Brake Systems
Prerequisite	32412402 Diesel Truck Chassis Systems
Prerequisite	32412403 Diesel Online Service Utilization
Prerequisite	32412404 Diesel Safety and Industry Practices
Prerequisite	32412405 Diesel Heavy Truck and Forklift Familiarization
Prerequisite	32412406 Diesel Electricity Fundamentals
Prerequisite	32412407 Diesel Electricity Troubleshooting
Prerequisite	32412303 Diesel Basic Engines

Textbooks

Fundamentals of Medium/Heavy Duty Commercial Vehicle Systems. 2nd Edition. Copyright 2020. Wright, Gus and Owen C. Duffy. Publisher: Jones & Bartlett Publishers. **ISBN-13:** 978-1-284-15093-3. Required.

Learner Supplies

Safety glasses with side eye protection that meet Z87 OSHA guidelines. **Vendor:** To be discussed in class. Required.

Six inch ankle high, quality leather work shoes - \$75.00-100.00. **Vendor:** To be discussed in class. Required.

Uniform: Four black/grey shirts. **Vendor:** Campus Shop. Required.

Success Abilities

1. Cultivate Passion: Expand a Growth-Mindset
2. Live Responsibly: Develop Resilience
3. Live Responsibly: Embrace Sustainability
4. Refine Professionalism: Improve Critical Thinking
5. Refine Professionalism: Participate Collaboratively
6. Refine Professionalism: Practice Effective Communication

High Impact Practices

1. Industry Credential or Certificate: by the end of this course, you will develop the skills necessary to obtain an industry-recognized certificate or credential.
2. Learning Community: these courses are designed to enhance your learning experience in which a cohort of peers complete two or more courses that are linked through projects, themes, or program emphasis.

Program Outcomes

1. Diagnose, repair and service HVAC systems

Course Competencies

1. **Examine theories of operation of HVAC systems.**

Assessment Strategies

- 1.1. Written Product
- 1.2. Written Objective Test
- 1.3. Skill Demonstration

Criteria

You will know you are successful when:

- 1.1. you earn 70% or higher on written exams.
- 1.2. you summarize the differences between the theories of operation of HVAC systems.
- 1.3. you include the characteristics of refrigerants.
- 1.4. you list HVAC system components.
- 1.5. you demonstrate correct grammar and spelling in written product.
- 1.6. you perform critical steps from task sheets in the right order from start to finish.
- 1.7. you complete lab task sheets with a minimum score of two.

1.8. you verbalize sound reasoning for the decisions made throughout the process.

Learning Objectives

- 1.a. Identify different refrigerants and refrigerant characteristics.
- 1.b. Identify HVAC system components.
- 1.c. Explain operation of all components of HVAC systems.

2. Demonstrate refrigerant recovery, recycling, and handling according to industry standards.

Assessment Strategies

- 2.1. Skill Demonstration
- 2.2. Written Objective Test

Criteria

You will know you are successful when:

- 2.1. you perform critical steps from task sheets in the right order from start to finish.
- 2.2. you complete lab task sheets with a minimum score of two.
- 2.3. you verbalize sound reasoning for the decisions made throughout the process.
- 2.4. you follow safety procedures.
- 2.5. you select the correct tools, equipment, instruments, material,s and supplies.
- 2.6. you attend class regularly and on time you, and meet criteria for successful completion of written products: lab sheets, presentations, and case studies.
- 2.7. you earn 70% or higher on written exams.

Learning Objectives

- 2.a. Identify and recover A/C system refrigerant.
- 2.b. Recover refrigerant properly.
- 2.c. Recycle refrigerant properly.

3. Identify need for HVAC repairs.

Assessment Strategies

- 3.1. Skill Demonstration
- 3.2. Written Objective Test

Criteria

You will know you are successful when:

- 3.1. you perform critical steps from task sheets in the right order from start to finish.
- 3.2. you complete lab task sheets with a minimum score of two.
- 3.3. you verbalize sound reasoning for the decisions made throughout the process.
- 3.4. you follow safety procedures.
- 3.5. you select the correct tools, equipment, instruments, materials, and supplies.
- 3.6. you attend class regularly and on time you, and meet criteria for successful completion of written products: lab sheets, presentations, and case studies.
- 3.7. you earn 70% or higher on written exams.

Learning Objectives

- 3.a. Verify the need for service or repair of HVAC systems.
- 3.b. Retrieve diagnostic codes; determine needed action.

4. Evaluate HVAC system.

Assessment Strategies

- 4.1. Skill Demonstration
- 4.2. Written Objective Test

Criteria

You will know you are successful when:

- 4.1. you perform critical steps from task sheets in the right order from start to finish.
- 4.2. you complete lab task sheets with a minimum score of two.
- 4.3. you verbalize sound reasoning for the decisions made throughout the process.
- 4.4. you follow safety procedures
- 4.5. you select the correct tools, equipment, instruments, materials, and supplies.

- 4.6. you attend class regularly and on time, and you meet criteria for successful completion of written products: lab sheets, presentations, and case studies.
- 4.7. you earn 70% or higher on written exams.

Learning Objectives

- 4.a. Check performance of HVAC system.
- 4.b. Determine needed action.

5. Evaluate compressor and clutch operations.

Assessment Strategies

- 5.1. Skill Demonstration
- 5.2. Written Objective Test

Criteria

You will know you are successful when:

- 5.1. you perform critical steps from task sheets in the right order from start to finish.
- 5.2. you complete lab task sheets with a minimum score of two.
- 5.3. you verbalize sound reasoning for the decisions made throughout the process.
- 5.4. you follow safety procedures.
- 5.5. you select the correct tools, equipment, instruments, materials, and supplies.
- 5.6. you attend class regularly and on time and you meet criteria for successful completion of written products: lab sheets, presentations, and case studies.
- 5.7. you earn 70% or higher on written exams.

Learning Objectives

- 5.a. Check for proper compressor operation.

6. Evaluate evaporator, condenser and related components.

Assessment Strategies

- 6.1. Skill Demonstration
- 6.2. Written Objective Test

Criteria

You will know you are successful when:

- 6.1. you perform critical steps from task sheets in the right order from start to finish.
- 6.2. you complete lab task sheets with a minimum score of two.
- 6.3. you verbalize sound reasoning for the decisions made throughout the process.
- 6.4. you follow safety procedures.
- 6.5. you select the correct tools, equipment, instruments, materials, and supplies.
- 6.6. you attend class regularly and on time, and you meet criteria for successful completion of written products: lab sheets, presentations, and case studies.
- 6.7. you earn 70% or higher on written exams.

Learning Objectives

- 6.a. Check for refrigerant leaks.

7. Evaluate cab heating system.

Assessment Strategies

- 7.1. Skill Demonstration
- 7.2. Written Objective Test

Criteria

You will know you are successful when:

- 7.1. you perform critical steps from task sheets in the right order from start to finish.
- 7.2. you complete lab task sheets with a minimum score of two.
- 7.3. you verbalize sound reasoning for the decisions made throughout the process.
- 7.4. you follow safety procedures.
- 7.5. you select the correct tools, equipment, instruments, materials, and supplies.
- 7.6. you attend class regularly and on time, and you meet criteria for successful completion of written products: lab sheets, presentations, and case studies.

7.7. you earn 70% or higher on written exams.

Learning Objectives

- 7.a. Identify causes of outlet air temperature control problems in the HVAC system.
- 7.b. Identify window fogging problem.

8. Evaluate operating system and related controls.

Assessment Strategies

- 8.1. Skill Demonstration
- 8.2. Written Objective Test

Criteria

You will know you are successful when:

- 8.1. you perform critical steps from task sheets in the right order from start to finish.
- 8.2. you complete lab task sheets with a minimum score of two.
- 8.3. you verbalize sound reasoning for the decisions made throughout the process.
- 8.4. you follow safety procedures.
- 8.5. you select the correct tools, equipment, instruments, materials, and supplies.
- 8.6. you attend class regularly and on time, and you meet criteria for successful completion of written products: lab sheets, presentations, and case studies.
- 8.7. you earn 70% or higher on written exams.

Learning Objectives

- 8.a. Check operation of controls.