

# Dakota County Technical College

## AUTM 2136: Heating, Ventilation, and Air Conditioning

### A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 1

Lab Hours/Week: 2

OJT Hours/Week: \*.\*

Prerequisites: None

Corequisites: None

MnTC Goals: None

This course covers the principles of air conditioning and types, diagnosis, testing, and repair of air conditioning systems. The course includes practical work on air conditioning systems such as evacuating, replacement of components, charging, recycling, and performance testing. Prerequisites: None

**B. COURSE EFFECTIVE DATES:** 03/10/1998 - Present

**C. OUTLINE OF MAJOR CONTENT AREAS**

#### **D. LEARNING OUTCOMES (General)**

1. Identify and demonstrate industry recognized professionalism and safety procedures
2. Complete repair orders to include customer information vehicle identifying information, customer concern, related service history, cause, and correction
3. Determine need for an additional A/C system filter; perform necessary action
4. Determine recommended oil for system application
5. Diagnose abnormal operating noises in the A/C system; determine necessary action
6. Identify and demonstrate proper use of various automotive tools and equipment
7. Identify and interpret heating and air conditioning concerns; determine necessary action
8. Identify refrigerant type; select and connect proper gauge set; record pressure readings
9. Inspect A/C condenser for airflow restrictions; perform necessary action
10. Inspect and replace A/C compressor drive belts; determine necessary action
11. Inspect evaporator housing water drain; perform necessary action
12. Inspect the condition of discharged oil; determine necessary action
13. Inspect, test, and/or replace A/C compressor clutch components and/or assembly
14. Leak test A/C system; determine necessary action
15. Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels)
16. Performance test A/C system; diagnose A/C system malfunctions using principles of refrigeration
17. Remove and inspect AC system mufflers, hoses, lines, fittings, O-rings, seals, and service valves; perform necessary action
18. Remove, inspect, and reinstall A/C compressor and mountings; determine required oil quantity
19. Remove, inspect, and reinstall receiver/drier or accumulator/drier; determine required oil quantity
20. Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins
21. Using scan tool, observe and record related HVAC data and trouble codes
22. Diagnose temperature control problems in the heater/ventilation system; determine necessary action
23. Evacuate and charge A/C system
24. Identify (by label application or use of a refrigerant identifier) and recover A/C system refrigerant
25. Inspect and test electrical cooling fan, fan control system, and circuits; determine necessary action
26. Inspect and test heater control valve(s); perform necessary action
27. Inspect engine cooling and heater system hoses and belts; perform necessary action
28. Label and store refrigerant
29. Perform correct use and maintenance of refrigerant handling equipment
30. Recycle refrigerant
31. Remove, inspect, and reinstall condenser; determine required oil quantity
32. Remove, inspect, and reinstall evaporator; determine required oil quantity
33. Remove, inspect, and reinstall heater core
34. Test recycled refrigerant for non-condensable gases

#### **E. Minnesota Transfer Curriculum Goal Area(s) and Competencies**

None

#### **F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

**G. SPECIAL INFORMATION**

None noted