



MASTER COURSE OUTLINE

A. AUTO 2460 Heating and Air Conditioning

B. COURSE DESCRIPTION:

The course covers the theory, principles, diagnosis, and repair of automotive heating and air conditioning systems. Proper refrigerant recovery equipment usage is also covered. At the conclusion of this course, students are required to take the federally mandated Automotive Service Excellence (ASE) 609 exam. This course, along with other program courses, satisfies the task requirements set forth in Section VII of the National Institute for Automotive Service Excellence (ASE) accreditation.

(3 Cr – 1 lect, 2 lab)

C. Core Theme: Critical Thinking

D. RIVERLAND INSTITUTIONAL LEARNING OUTCOMES:

This course addresses the following Riverland Institutional Learning Outcome(s):

- ☒ ILO 1: critical thinking (*Core Theme Goal 2*)
- ☐ ILO 2: awareness of the larger global community (*Core Theme Goal 7 or 8*)
- ☐ ILO 3: ethical, engaged citizenship (*Core Theme Goal 9 or Goal 10*)
- ☐ ILO 4: communication and collaboration (*Discipline Goal 1 and by any learning outcome(s) involving communication or collaboration*)

E. MAJOR CONTENT AREAS:

- Basic principles and theory of climate control
- Air conditioning system operation and theory
- Heating system operation and theory
- Refrigeration system testing, diagnosis, and repair
- Heating system testing, diagnosis, and repair
- Refrigerant recovery, handling, recharging, and retrofitting
- Air conditioning component repair
- Air management and delivery systems

F. GOAL TYPE, OBJECTIVES, AND OUTCOMES:

<u>GOAL TYPE</u>	<u>OBJECTIVES</u> Students will be able to	<u>OUTCOMES</u> The student will successfully
**Critical Thinking	gather factual information and apply it to a given problem in a manner that is relevant, clear, comprehensive, and	1. evaluate air conditioning (A/C) pressure to determine problems.

	conscious of possible bias in the information selected.	
<u>CS</u>	demonstrate an understanding of electrical testing on heating and A/C systems.	1. read vehicle wiring diagrams. 2. apply wiring diagram circuits to circuit boards. 3. use a digital volt ohm meter (DVOM) to diagnose problems. 4. use an oscilloscope to diagnose problems.
<u>CS</u>	demonstrate and understanding of mechanical repairs on a heating ventilation and A/C system.	1. remove and replace evaporator/heater core. 2. remove and replace condenser. 3. remove and replace compressor and clutch. 4. reclaim refrigerant. 5. evacuate and recharge the A/C system.

G. SPECIAL INFORMATION:

This course may require use of the Internet, the submission of electronically prepared documents and the use of a course management software program. Students who have a disability and need accommodations should contact Accessibility Services at the beginning of the semester. This information will be made available in alternative format, such as Braille, large print, or current media, upon request.

The student will need access to and use of a laptop computer capable of running required software.

H. COURSE CODING INFORMATION: Course Code S/Class Maximum 24; Letter Grade

Revision date: 03/09/11; 11/29/17; 07/08/22

AASC Approval date: 12/12/17; 10/18/22

*Riverland Community College Disciplines	MnTC Goal Number
Communication (CM)	1
Natural Sciences (NS)	3
Mathematics/Logical Reasoning (MA)	4
History and the Social & Behavioral Sciences (SS)	5
Humanities and Fine Arts (HU)	6

**Riverland Community College Core Themes	MnTC Goal Number
Critical Thinking (CT)	2
Human Diversity (HD)	7
Global Perspective (GP)	8
Ethical and Civic Responsibility (EC)	9
People and the Environment (PE)	10

*These five MnTC Goals have been identified as Riverland Community College Disciplines.

** These five MnTC Goals have been identified as Riverland Community College Core Themes.

NOTE: The Minnesota Transfer Curriculum “10 Goal Areas of Emphasis” are reflected in the five required discipline areas and five core themes noted in the Riverland Community College program of study guide and/or college catalog.