MASTER COURSE OUTLINE

A. AUTO 2476 Electric Vehicle and Hybrid Drive Systems

B. COURSE DESCRIPTION:

This course consists of theory and hands-on application through the use of electric vehicle (EV) and hybrid vehicle (HV) technology.
(4 Cr – 2 lect, 2 lab)

C. *Core Theme: Critical Thinking; People and the Environment

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:

- EV/hybrid safety
- EV/hybrid components and operation
- Maintenance of EV/hybrid vehicles
- Fault testing
- Repair of low voltage systems

F. GOAL TYPE, OBJECTIVES, AND OUTCOMES:

GOAL TYPE	**OBJECTIVES** **Students will be able to**	**OUTCOMES** **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 conscious of possible bias in the information selected	1. utilize service information to find specifications and procedures for performing high voltage system tests.
*People and the Environment	articulate and defend the actions they would take on various environmental issues.	1. the student will understand the importance of minimizing pollution and resource usage.

CS	exercise safety when working on the high voltage vehicle systems.	1. set up a safety perimeter in the workshop area prior to beginning work on the HV system. 2. understand the purpose and use proper PPE prior to beginning HV work.
CS	identify power flow.	1. explain the transfer of power through an EV powertrain. 2. explain the transfer of power through a hybrid vehicle powertrain.
CS	perform tests on EV and hybrid drive system components.	1. accurately test for isolation of the HV system. 2. test motor drive systems for proper resistance. 3. test functionality of the low voltage 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 a laptop computer capable of running the required software.

H. COURSE CODING INFORMATION:

Course Code S/Class Maximum 24; Letter Grade

Revision date:
AASC Approval date: 12/16/25

*These five MnTC Goals have been identified as Riverland Community College Core Themes. Every course in the Riverland Community College curriculum shall meet outcomes from one of these themes.
**These five MnTC Goals have been identified as Riverland Community College Disciplines. Riverland's MnTC courses also shall meet outcomes from a Discipline Area.

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.

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

**Riverland Community College Discipline Areas	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**