MASTER COURSE OUTLINE

A. ARET 2105 Fluid Power Motion Control

B. COURSE DESCRIPTION:

This course is intended for students entering the fields of Mechatronics and Packaging. This course covers the function, operation, and application of common components used in fluid power circuits and systems. It also assesses the understanding of how fluid power components and accessories are placed together to create circuits and systems for use in robotics, mechatronics systems, and packaging. The major emphasis is on pneumatics with a lesser emphasis on vacuum systems. Electro-fluid power troubleshooting is also emphasized. **(2 Cr – 1 lect, 1 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:

- Solenoid-operated directional control valves
- Circuits with electro-pneumatic controls
- Fluid power calculations and troubleshooting mechatronic systems
- Pneumatic component failures
- Pneumatic schematic
- Pneumatics in motion control with mechatronic systems
- Pneumatic circuits in mechatronic 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. analyze pneumatic component failures. 2. critique the operation of solenoid-operated directional control valve.
CS	recognize pneumatics in motion control with mechatronic systems.	1. identify circuits with electro-pneumatic controls.
CS	recognize pneumatic schematics.	1. identify the function of a pneumatic schematic.
CS	apply fluid power calculations to troubleshooting mechatronic systems.	1. articulate proper troubleshooting techniques.

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.

H. COURSE CODING INFORMATION:

Course Code S/Class Maximum 24; Letter Grade

Revision date: 02/03/26
AASC Approval date: 02/15/22; 03/17/26

*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**