



## MASTER COURSE OUTLINE

A. ARET 1161 Mechatronic Systems

B. COURSE DESCRIPTION:

This course explores how mechatronic systems are utilized in industry. This course will focus on the packaging industry, but can be applied to manufacturing and product conveyance as a whole. A wide variety of machinery will be examined as well as the tooling necessary for basic component fabrication and part modification. Basic metalworking and welding concepts will be examined. Students will receive a hands-on experience leading to a greater understanding of how machinery operates, and the skills needed to successfully work with complex machinery in industry.

**(3 Cr – 2 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:

- Machine operation safety
- Hand and power tools
- Machine performance and production requirements
- Machine guarding applications
- Mechatronic systems
- Operating procedures safety for mechatronic systems
- Machine operation and maintenance documentation
- Welding theory and equipment
- Automated manufacturing lines components
- Electrical control and power schematics

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
<u>**Critical Thinking</u>	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.	<ol style="list-style-type: none"> <li>1. apply safety procedures to machine operation.</li> <li>2. critique safe operating procedures to mechatronic systems.</li> </ol>
<u>CS</u>	appraise components of automated manufacturing lines.	<ol style="list-style-type: none"> <li>1. differentiate between types of mechatronic systems.</li> </ol>
<u>CS</u>	document that machine performance meets production requirement.	<ol style="list-style-type: none"> <li>1. describe machine guarding and its application.</li> <li>2. interpret machine operation and maintenance documentation.</li> </ol>
<u>CS</u>	explain processors, the power supply system and programming devices.	<ol style="list-style-type: none"> <li>1. explain electrical control and power schematics.</li> <li>2. identify error checking and diagnostics.</li> </ol>

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:

AASC Approval date: 02/15/22

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

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

\*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.

Riverland