RIVERLAND
Community College

MASTER COURSE OUTLINE

A. ELEC 2701 Electric Motors I

B. COURSE DESCRIPTION:

This course covers the various construction characteristics and uses of alternating current (AC) single-phase and three-phase motors. Also covered in this course is recognition, installation, and troubleshooting of all common AC motors for National Electrical Code (NEC) requirements and calculations. Prerequisites: ELEC 1705.
(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:

- Single-phase motor types
  - Repulsion
  - Split phase
  - Capacitor start – induction run
  - Capacitor start – capacitor run
  - Universal
- Three-phase motor types
  - Squirrel cage induction
  - Wound rotor
  - Synchronous
- Alternating current (AC) motor calculations for overload, branch circuit, wire sizing
- National Electrical Code (NEC) Article 430
- Bearings and seals
- Precision measuring

F. GOAL TYPES, OBJECTIVES, AND OUTCOMES:

GOAL	**OBJECTIVES** **Students will be able to**	**OUTCOMES** **The student will successfully**
*Critical Thinking	analyze the logical connections among the facts, goals, and implicit assumptions relevant to a problem or claim; generate and evaluate implications that follow from them.	1. demonstrate the different types of single-phase and three-phase AC motors, their different operating characteristics, NEC installation requirements, and calculate overload, short circuit, and wire sizing.
CS	understand single-phase AC motors.	1. connect AC single-phase motors.
CS	understand three-phase motors.	1. connect three-phase motors.
CS	understand AC motor calculations.	1. calculate AC motor overload, overcurrent, and wire sizes.
CS	understand the use of precision measuring.	1. use calipers, micrometers, and tape measures to measure shafts, bearings, and races in metrics and fractions.
CS	understand the parts of a motor and how they function.	1. disassemble a motor and identify the parts.

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 28; Letter Grade

Revision date: 10/14/14; 04/02/24
AASC Approval date: 11/18/14; 05/07/24

*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)	**7**
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**