Heartland Community College
Master Course Syllabus

Division Name: **CTE**
Course Prefix and Number: **MAIN 101**
Course Title: **Industrial and Building Electricity**

DATE PREPARED: **August 25, 1994**
DATE REVIEWED: **November 2019**
DATE REVISED: **November 2019**

PCS/CIP/ID NO.: **12-470303**
IAI NO. (if available):

EFFECTIVE DATE OF FIRST CLASS: August 2020

CREDIT HOURS: **3**
CONTACT HOURS: **4**
LECTURE HOURS: **2**
LABORATORY HOURS: **2**

PREREQUISITE(S):
-Completion of TMAT 103 OR
-Completion of MATH 092

CATALOG DESCRIPTION:
Industrial and Building Electricity is a basic course in the operation, characteristics, and applications of industrial electricity, building electricity, and industrial systems. You will learn about function and practice of industrial controls in fluid power, mechanical, and/or electrical systems. Additionally, you will learn the theory and practice of industrial electricity and building electricity as they relate to industrial systems and other technological fields.

TEXTBOOKS:
Instructors for this class should use the following textbooks or comparable text that addresses at a minimum the topics listed in the Course Outline and that provides students with the opportunity to achieve the learning outcomes for this course:

Amatrol Learning Content (available via activation codes)

Mazur, Glen and Peter Zurlis. (2013). *Electrical Principles and Practices 3rd edition*. Orland Park, IL: American Technical Publishers.

Mazur, Glen and Peter Zurlis. (2013). *Electrical Principles and Practices Workbook 3rd edition*. Orland Park, IL: American Technical Publishers.

RELATIONSHIP TO ACADEMIC DEVELOPMENT PROGRAMS AND TRANSFERABILITY:
MAIN 101 was designed to meet the specific needs of an Associate of Applied Science degree and not necessarily as a transfer course, particularly in relation to the Illinois Articulation Initiative. This course may transfer to various institutions in a variety of ways. Please see an academic advisor for an explanation concerning transfer options.

LEARNING OUTCOMES:

Course Outcomes	**Essential Competencies**	**Range of Assessment Methods**
1. Identify basic components of industrial and building electrical circuits and devices	PS/CT	Exams/Quizzes Assignments Labs
2. Physically demonstrate an understanding of proper safety used in an industrial and building electrical environments	T	Labs
3. Troubleshoot a complex circuit using passive electrical devices	T	Assignments/Exams Labs
4. Apply appropriate techniques to correctly measure voltage, current and resistance using bench top testing devices	T	Assignments Labs
5. Research and apply, along with reflect and share, in written form, information about industrial technology as it relates to the student's field of study	C	Assignments Final Project

ESSENTIAL COMPETENCIES:
Communication (C) - Students communicate effectively.
Problem Solving/Critical Thinking (PS/CT) - Students think critically to solve problems or explore issues.
Technology (T) - Students appropriately utilize technology.

PROGRAM OUTCOME(S):
- Troubleshoot and repair electronic and mechanical systems. (MAIN 101, MAIN 202)
- Develop specialized technical skills in one or more areas (Design & Fabrication, Construction, Electronics, Renewable Energy, Facilities Maintenance, Industrial Maintenance, and/or Welding).

COURSE/LAB OUTLINE:

1. Electrical concepts
2. Mechanical power concepts
3. AC/DC principals
4. Voltage measurements and calculations
5. Resistance and loads measurements and calculations
6. Electrical schematic designing/reading
7. Fundamentals of blueprints, schematics and prints
8. Electrical components
9. Industrial electricity and systems
10. Building electricity and systems
11. Industrial and building controls
12. Power distribution
13. Troubleshooting techniques
14. Automation and control measuring devices
15. Understanding AC/DC motors

METHOD OF EVALUATION (Tests/Exams, Grading System):

Assessment Method	**% of Final Grade**
Exams/Quizzes	20-40%
Labs	20-40%
Assignments (may include a Final Project)	20-40%
TOTAL	100%

Course grades will be determined by the use of the following grading scale:

A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	Below 60%

REQUIRED WRITING AND READING:

Documentation is an important part of this course. All labs are to include descriptive comments within the write-up/answer section relating to each lab. Students will be expected to read assigned selections from the textbook and or labs, articles or other course related materials, at a minimum of 25 pages per week. Estimate is based on a 16-week course schedule. Please note if your class is not a 16-week class your weekly reading assignment will be increased. There is no formal research or writing assignments in this course. However, discipline specific writing and documentation is an important part of these courses, therefore discipline appropriate writing/reading methods will be taught and used in this course.

SAMPLE COURSE CALENDAR:
This sample course calendar is provided to guide instructors; each instructor will modify to suit.

Module #	**Module Topic(s)**
#00	Course Introduction Hazardous Material Communication Lockout/Tagout
#01	Basic Electrical Circuits Electrical Measurements
#02	Circuit Analysis
#03	Inductance and Capacitance Combination Circuits
#04	Transformers Midterm Exam
#05	Introduction to Electrical Wiring Residential Wiring System Components Service Connections and Circuit Protection
#06	Basic Conduit Bending Control Logic
#07	Sequencing Control Split-Phase AC Motors
#08	Course Wrap Up
#09	Final Exam