

**Columbus State Community College  
Advanced Manufacturing Institute**

**COURSE:** Maintenance Awareness Program

**INSTRUCTOR:** Brian Schaefer, bschaefer4@csc.edu

**FACILITATOR:** Theo McKaye, tmckaye@csc.edu

**CREDITS:** 0

**PREREQUISITES:** None

**DESCRIPTION OF COURSE**

This course is a fast-paced 8-week course that will cover basic AC/DC electrical circuits and basic operation of three phase motors using relay ladder logic. It will also examine the basic features of mechanical drive systems and hydraulic/pneumatic circuits.

**COURSE GOALS**

Upon successful completion of this course students should have an understanding of how current, resistance and voltage are affected by circuits with series and parallel loads; Basic operation of three phase motors with overload protection; How to mount and level an electric motor; Connect and operate basic hydraulic components and systems; Students will also obtain a MSSC CPT certification through an exam taken in the Columbus State Career and Professional Testing Center.

**GENERAL EDUCATION GOALS**

1. Critical Thinking
2. Information Literacy

**STUDENT LEARNING OUTCOMES**

1. AC/DC voltage and current principles
2. Series and parallel circuits
3. Introduction to electric motor control applications
4. Motor mounting and leveling
5. Basic hydraulic/pneumatic circuits

**TEXTBOOKS—REQUIRED AND OPTIONAL READINGS**

NONE

### **INSTRUCTIONAL METHODS**

Multi-media lectures. Reading Assignments. Hands-on lab exercises.

### **SPECIAL COURSE REQUIREMENTS**

- Cell phones must be off or on vibrate during class.
- It is the student's responsibility to obtain missed handouts and assignments.

### **ATTENDANCE POLICY**

Regular attendance is required to successfully complete the class. If a student acquires 4 unexcused absences, completion of the class will no longer be possible. In addition, if you miss a class for any reason, you are responsible for working with the Instructor and/or Facilitator to make up any missed activities.

### **STUDENT CODE OF CONDUCT**

As an enrolled student at Columbus State Community College, you have agreed to abide by the Student Code of Conduct as outlined in the Student Handbook. You should familiarize yourself with the student code. The Columbus State Community College expects you to exhibit high standards of academic integrity, respect and responsibility. Any confirmed incidence of misconduct, including plagiarism and other forms of cheating, will be treated seriously and in accordance with College Policy and Procedure 7-10.

### **AMERICANS WITH DISABILITIES ACT (ADA) POLICY**

It is Columbus State policy to provide reasonable accommodations to students with documented disabilities. If you would like to request such accommodations because of physical, mental or learning disability, please contact the Department of Disability Services, 101 Eibling Hall, 614.287.2570 (V/TTY), [or visit Columbus State's Disability Website](#). Delaware Campus students may also contact an advisor in the Student Services Center, first floor Moeller Hall, 740.203.8000. Ask for Delaware Campus advising, or visit Columbus State's [Delaware](#) website for assistance.

### **INCLEMENT WEATHER OR OTHER EMERGENCIES**

In the event of severe weather or other emergencies that could force the college to close or to cancel classes, such information will be broadcast on radio stations and television stations. Students who reside in areas that fall under a Level III emergency should not attempt to drive to the college even if the college remains open.

Students who miss a class because of weather-related problems with the class is held as scheduled are responsible for reading and other assignments as indicated in the syllabus. If a laboratory or examination is missed, contact me as soon as possible to determine how to make up the missed exam or lab. Remember! It is the student's responsibility to keep up with reading and other assignments when a scheduled class does not meet, whatever the reason.

## **FINANCIAL AID ATTENDANCE REPORTING**

Columbus State is required by federal law to verify the enrollment of students who participate in Federal Title IV student aid programs and/or who receive educational benefits through the Department of Veterans Affairs. It is the responsibility of the College to identify students who do not commence attendance or who stop attendance in any course for which they are registered and paid. Non-attendance is reported quarterly by each instructor, and results in a student being administratively withdrawn from the class section. Please contact the Financial Aid Office for information regarding the impact of course withdrawals on financial aid eligibility.

## **UNITS OF INSTRUCTION**

### **WEEK 1**

***Basic Electrical Circuits (unit 55)***

***Electrical Measurement (unit 56)***

LAB – AC/DC Electrical System LAPs 1, 2

### **WEEK 2**

***Electrical Power (unit 57)***

***Machine Control Concepts (unit 64)***

LAB – Motor Control System LAPs 1, 2, 4

### **WEEK 3**

***Machine Automation (unit 65)***

***Welding (unit 54)***

LAB – Motor Control System LAPs 5, 9, 10

### **WEEK 4**

***Pneumatic Power Systems (unit 58)***

***Hydraulic Power Systems (unit 59)***

LAB – Basic Pneumatics LAPs 1, 2

**WEEK 5**

***Safety (unit 12)***

Safety Organization

***Lubrication Concepts (unit 60)***

LAB – Mechanical Systems 2 LAP 4

**WEEK 6**

***Safety (unit13)***

Personal Protective Equipment

***Bearings and Couplings (unit 61)***

LAB – Mechanical Systems 1 LAP 1

**WEEK 7**

***Safety (unit 14)***

Fire and Electric Safety

***Belt Drives (unit 62)***

LAB – Mechanical Systems 1 LAP 4

**WEEK 8**

***Safety (unit 15)***

Work Area Safety

***Chain Drives (unit 63)***

LAB – Mechanical Systems 1 LAP 5

**WEEK 9**

***Safety (unit 16)***

Hazardous material Safety

***Safety (unit 17)***

Tool and Machine Safety

**WEEK 10**

***Safety (unit 18)***

Material Handling Safety

***MSSC – CPT Maintenance Awareness Test***



This workforce product was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The U.S. Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership.



This work is licensed under the Creative Commons Attribution 4.0 International License. It is attributed to Ohio TechNet. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>.