



**Course Syllabus**

**Course #:** EET-2400 **Course Name:** Motor Control

**Division:** Engineering and Industrial Technologies

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**Class Days:** \_\_\_\_\_ **Class Time:** \_\_\_\_\_  
**Location:** Classroom: \_\_\_\_\_ **Laboratory:** \_\_\_\_\_  
**Credit Hours:** 4 **Contact Hours:** 6 **Lab Hours:** 4 **Lecture Hours:** 2

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**Instructor:** \_\_\_\_\_ **Office Location:** \_\_\_\_\_  
**Phone:** \_\_\_\_\_ **Email Address:** \_\_\_\_\_

**Office Hours:** TBD

**Division Office/Location:** Engineering Building **Division Fax:** 419-334-2300

**Full-time Contact Person:** Jayne Bowersox **Phone(s):** (419) 559-2410  
(800)334-3886 ext 410

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**Course Description:** To familiarize the student with a hands-on approach to wiring practices, operation, and troubleshooting of various control and power circuits utilized in the industrial control of motors.

**Prerequisite(s):** EET 1320 AC/DC Machines

**Corequisite(s):** None

**Entry Level Skills and Knowledge:**

A working knowledge of the fundamentals of electricity and the operation of the different types of electric motors and transformers

**Required Texts, Supplies and Equipment:**

- Text: Electrical Motor Controls - Rockis & Mazur 3rd edition
- Electrical Engineering Pocket Handbook - Electrical Apprentice Service Association
- Motor Control Lab Booklet - Terra Community College

- Materials: Safety Glasses
- Screw Driver
- Wire Stripper
- Multimeter (Analog or Digital)
- Small Adjustable End Wrench

**Grading:**

Test 1  
Test 2  
Lab Test 1  
Lab Test 2  
Completion of all labs  
Final

**Grading:**

100 - 90 = A  
89 - 80 = B  
79 - 70 = C  
69 - 60 = D  
59 - 0 = F

**Learning Outcomes:**

General Education

1. **Communicate effectively**
2. **Evaluate arguments in a logical fashion**—Competence in analysis and logical argument are explicit learning goals for most general education programs, although these skills go by a variety of names (e.g., critical thinking, analysis, logical thinking, etc.). **Students will be able to demonstrate competence in problem solving in communication, mathematics, and in team settings.**
3. **Employ the methods of inquiry characteristic of natural sciences, social sciences, mathematics, and the arts and humanities;** general education introduces students to methods of inquiry in several fields of study and thereby prepares students to integrate information from different disciplines.

The students are required to successfully wire and troubleshoot the following:

- \* Start/stop circuit with relays and starters
- \* Dual start/stop circuit
- \* On and off delay pneumatic timer circuits
- \* Eagle timer circuits
- \* Dual voltage control transformers
- \* Three phase disconnects
- \* Dual start/stop with extra start and stop buttons
- \* Jogging circuits
- \* Sequence control circuits (two motor starters)
- \* Reversing circuit with reversing starter and push-button and auxiliary

contact interlocking.

\* Three phase motor and its control circuit

### **Assessment of Student Learning:**

Assessment Project and Measurement in course (if any):

### **Plan of Work:**

<u>Week</u>	<u>READING</u>	<u>ACTIVITY</u>
Week 1	Chapter 3,4	Introduction/Safety - NFPA 79 Electrical Symbols and Diagrams
Week 2	Chapter 5	Introduction to Logic of line diagrams
Week 3	Chapter 6	Magnetic Solenoids
Week 4	Chapter 8	Contact-Starters
Week 5	Chapter 9	Control Devices
Week 6		<b>Written Test 1 and Lab Test 1</b>
Week 7	Chapter 9	Timers and Counters
Week 8	Chapter 10	Reversing Motor Circuits
Week 9	Chapter 11	Power Distribution systems
Week 10	Chapter 14	Relays and Solid State Starters
Week 11	Chapter 15	Sensing Devices and Control
Week 12		<b>Written Test 2 and Lab Test 2</b>
Week 13	Chapter 19	Preventive Maintenance & Troubleshooting
Week 14		Introduction to PLCs
Week 15		Academic Accessment
Week 16		<b>FINAL</b>

**Labs :**

- 1, 2. Motor starters, limit switches, Limit switch mounting application push button switches, troubleshooting
3. Lockout/tagout, sequence control, multiple control, jog/run, delay
4. Motor driven timer wiring/ladder diagram
5. Ladder logic system, cabinet layout - NFPA 79
  
6. Line & number reference,  
Auto/Manual,  
Two hand start.
7. **Lab test I**
8. Reversing Motor Starters
9. Photo electric: 2w, 3w, 4w, thru beam, reflected beam
10. Capacitive proximity control, Inductive proximity control
11. Ladder logic troubleshooting
12. Documentation prints Ladder/wiring diagram
13. **Lab test II**
14. Assessment PLC System Wiring Master Control Relay and I & O  
Start/Stop Troubleshooting  
Auto/Manual Mode
15. System troubleshooting (continuous through whole quarter)  
PLC programming
16. **Final**

**Course Requirements:**

Complete all assignments as required

**Policies**

**Course Withdrawing:** If for any reason you need to withdraw from this course, be certain that you do so according to College procedure. It is your responsibility to know and follow this procedure. If you simply stop coming to class, without officially withdrawing from the course, your grade is an automatic "F." Please follow official College procedure for withdrawing from this or any course.

*College Academic Policies are located in the College Catalog. A copy of the current catalog may be picked up in any of the division offices or admissions. The list of college policies is also available online at <https://www.terra.edu/register/Collegecat/policies.asp>.*

**Support Services:** The College offers a number of support services to assist in your success in this course and all courses. Among these services are the Writing & Math Center in B105, the Office of Learning Support Services, which coordinates the campus disability services and tutoring programs, the computer labs, and the computers in the atriums.

Any student who feels he/she may need an accommodation based on the documentation of a disability should contact the Office of Learning Support Services privately to discuss his/her specific issues. Please contact the OLSS at (419) 334-8400 X 208 or visit 100 Roy Klay Hall (Building A) to coordinate reasonable accommodations.

***If you have a documented disability and are receiving academic accommodations through the Office of Learning Support Services, please schedule a meeting with your instructor in a timely manner so that we may discuss how these services will be arranged.***

Tutoring services are available to students beginning the second week of every quarter. Students requesting tutoring services should obtain a tutor request form from the OLSS in 100 Roy Klay Hall (Building A) or online at the Terra website. Please note that instructor verification and acceptance of the Student Learner Agreement is necessary for all tutoring requests. All requests should be submitted to 100 Roy Klay Hall (Building A).