



MOTOR CONTROLS

IEIR 1410

INSTRUCTOR: _____ **Office Phone:** 335-6832 **Cell Phone:** _____ **Office Hours:** As Posted

COURSE NUMBER: IEIR 1410

CREDIT HOURS: 4 (3/3)

PREREQUISITE: NONE

CATALOGUE DESCRIPTION:

General principles and fundamentals of electrical controls and control components including starters, troubleshooting techniques, various protective devices, schematics, and diagrams. (SCANS 3,5,8,9)

TEXTBOOK Electric Motor Controls by Rockis & Mazur ISBN: 978-0-8269-1217-6

- SUPPLIES:**
1. Calculator
 2. Digital VOM meter
 3. Other

LEARNING OUTCOMES:

After completing this course, the student should be able to demonstrate competency in:

- Install motor starters to control electric motors
- interpret schematic and wiring diagrams
- interpret schematic and wiring diagrams
- and troubleshoot motor control circuits

COURSE REQUIREMENTS:

- Complete all scheduled homework
- Complete all scheduled labs
- Complete written\lab tests
- Complete a written\lab final test

METHODS OF EVALUATION:

| GRADING SCALE | |
|---------------|-------|
| POINTS | GRADE |
| 90-100 | A |
| 80-89 | B |
| 70-79 | C |
| 65-69 | D |
| 0-64 | F |

| WEIGHT OF COURSE REQUIREMENTS | |
|-------------------------------|--------------|
| AREA | GRADE WEIGHT |
| LAB ASSIGNMENTS | 25% |
| TESTS | 25% |
| FINAL TEST | 25% |
| PROFESSIONALISM | 25% |
| TOTAL | 100% |

ATTENDANCE POLICY\PROFESSIONALISM POLICY

Attendance is the greatest predictor of your success. Your attendance at EVERY ONE of the classes and labs is important and expected. A substantial grade penalty will be assessed to late work; including homework, lab assignments, and test. The "Professionalism Grade" will be determined by such factors as attendance, tardiness, class participation, and other classroom factors.

The following chart is a syllabus outline for topics and task. Each topic may include labs, lab questions, and other requirements.

| LESSON # | GENERAL TOPIC | SPECIFIC TOPIC | LAB\TASK\INFO |
|-------------|--------------------------|---|---|
| 1 | Intro Syllabus Review | <ul style="list-style-type: none"> ✓ Syllabus ✓ Safety | <ul style="list-style-type: none"> ➤ Safety Video ➤ Safety Exam |
| 1.1 | Line Diagrams | <ul style="list-style-type: none"> ✓ Basic Line Diagrams ✓ Ladder Logic | ➤ LAB 1.1 |
| 2 | Pushbuttons | <ul style="list-style-type: none"> ✓ Normally Open (NO) Contacts ✓ Normally Closed (NC) Contacts | ➤ LAB 2.1 |
| 3 | | <ul style="list-style-type: none"> ✓ Series Circuits ✓ Parallel Circuits ✓ Combination Circuits | ➤ LAB 3.1 |
| 4 | Relays | <ul style="list-style-type: none"> ✓ Basic Relays ✓ Coil Voltages ✓ NO and NC Contacts ✓ Basic 8 Pin Relay Configuration | ➤ LAB 4.1 |
| 5 | | <ul style="list-style-type: none"> ✓ Relay Circuits ✓ Pushbuttons NC & NO w Relays | <ul style="list-style-type: none"> ➤ LAB 5.1 Electrical Lockouts ➤ Holding Contacts ➤ Slave\Master Circuits ➤ OR and AND configurations |
| 6 | | <ul style="list-style-type: none"> ✓ Relay Circuit Design | <ul style="list-style-type: none"> ➤ LAB 6.1 Electrical Lockouts ➤ Game Show Project |
| 7 | | <ul style="list-style-type: none"> ✓ Relay Circuit Design | <ul style="list-style-type: none"> ➤ LAB 7.1 Relay Control ➤ Low Oil Pressure ➤ High Oil Pressure |
| 8 | | <ul style="list-style-type: none"> ✓ Latching Relays | ➤ LAB 8.1 First Out Circuit |
| TEST | | | |
| 9 | Time Delay Relays | <ul style="list-style-type: none"> ✓ Basic Time Delays ✓ 8 pin configuration ✓ On-delay Off-delay | ➤ LAB 10.1 TD Circuits |
| 10 | | <ul style="list-style-type: none"> ✓ Time Delay Uses | <ul style="list-style-type: none"> ➤ Lab 11.1 TD Sequential ➤ TD Delayed Stop ➤ TD Delayed Start |
| 11 | | <ul style="list-style-type: none"> ✓ Time Delay Uses | ➤ LAB 12.1 Low Oil Pressure Bypass |
| 12 | Motor Starters | <ul style="list-style-type: none"> ✓ Induction Motor Characteristics ✓ Starter Characteristics ✓ Overloads\heaters ✓ 1ϕ and 3ϕ identification | <ul style="list-style-type: none"> ➤ LAB 13.1 Starter Basics ➤ Identification of coil, heaters, and overloads and their uses |
| 13 | | <ul style="list-style-type: none"> ✓ 1ϕand3ϕMotor Connections ✓ Dual Voltage Motors ✓ Other Motor Connections ✓ Starter Circuits ✓ Pushbuttons and Relays w Starters | <ul style="list-style-type: none"> ➤ LAB 14.1 Starter Control Circuits ➤ Stop\Start ➤ Parallel and Series Control |

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|-------------------|---|--|---|
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| 14 | Motor Starters | <ul style="list-style-type: none"> ✓ Troubleshooting 1 ϕ and 3 ϕ Motors ✓ Starter Circuits w Time Delays | ➤ LAB 15.1 Starter Control w Time Delay |
| TEST | | | |
| 15 | <ul style="list-style-type: none"> Motors -Reversing -Techniques for Starting -Braking -Other Techniques | <ul style="list-style-type: none"> ✓ Reversing Starters | <ul style="list-style-type: none"> ➤ LAB 16.1 ➤ Reversing ➤ Electrical and Mechanical Interlocks ➤ Reversing w. Time Delays |
| 16 | | <ul style="list-style-type: none"> ✓ Motor Soft Start | ➤ LAB 17.1 Techniques for soft start |
| 17 | | <ul style="list-style-type: none"> ✓ Motor Braking | ➤ LAB 18.1 Techniques for braking |
| 20 | Transformers | <ul style="list-style-type: none"> ✓ Transformer Identification and Design techniques | ➤ LAB 19.1 Transformers |
| FINAL TEST | | | |
| | | | |
| | | | |

Special Needs

Odessa College complies with Section 504 of the Vocational Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990. If you have any special needs or issues pertaining to your access to and participation in this or any other class at Odessa College, please feel free to contact me to discuss your concerns. You may also call the Office of Disability services at 432-335-6861 to request assistance and accommodations.

Learning Resource Center (Library)

The Library, known as the [Learning Resources Center](#), provides research assistance via the [LRC's catalog \(print books, videos, e-books\)](#) and [databases \(journal and magazine articles\)](#). [Research guides](#) covering specific subject areas, [tutorials](#), and the "Ask a Librarian" service provide additional help.

Student E-mail

Please access your [Odessa College Student E-mail](#), by following the link to either set up or update your account: <http://www.odessa.edu/gmail/>. **All assignments or correspondence will be submitted using your Odessa College email.**

Student Portal

Please access your [Odessa College Student E-mail](#), by following the link to either set up or update your account: <http://www.odessa.edu/gmail/>. **All assignments or correspondence will be submitted using your Odessa College email.**

Technical Support

For Blackboard username and password help and for help accessing your online course availability and student email account contact the Student Success Center at 432-335-6878 or online at https://www.odessa.edu/dept/ssc/helpdesk_form.htm.

Important School Policies

For information regarding student support services, academic dishonesty, disciplinary actions, special accommodations, or student's and instructors' right to academic freedom can be found in the [Odessa College Student Handbook](#).