COURSE SYLLABUS FOR

PROGRAMMABLE LOGIC CONTROLLERS

ELPT 2419

INSTRUCTOR: Jim Traylor

COURSE NUMBER: ELPT 2419

CREDIT HOURS: 4 (3/3)

PREREQUISITE: NONE

CATALOGUE DESCRIPTION: Fundamental concepts of programmable logic controllers, principles of operation, and numbering systems as applied to electrical controls. Devices, circuits, and systems primarily used in automated manufacturing and/or process control including computer controls and interfacing between mechanical, electrical, electronic, and computer equipment. Includes presentation of programming schemes. (ICO's 1,2,3,4)

TEXTBOOK GEFanuc Software

SUPPLIES: None

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

- Identify and describe digital logic circuits
- explain numbering systems
- explain the operation of programmable logic controllers
- convert ladder diagrams into programs
- incorporate timers and counters utilizing programmable logic controllers
- execute and evaluate programs.

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.

PROGRAMMABLE LOGIC CONTROLLERS
SYLLABUS CHART

LESSON #	GENERAL TOPIC	SPECIFIC TOPIC	LAB\TASK\INFO
1	Intro Syllabus Review Basic PLC	✓ Ladder Logic ✓ Inputs and outputs ✓ PLC configuration	➢ LAB 1.1 ➢ Software characteristics ➢ Inputs and outputs ➢ NO\NC contacts and Coils
2	Inputs and Outputs	✓ Device Identification ✓ Basic programming	➢ LAB 2.1 ➢ Series\parallel inputs ➢ Output characteristics
3	Inputs and Outputs	✓ Internal Coils (1M) ✓ Electrical Lockouts	➢ LAB 3.1 ➢ Programming ➢ Design
4	Latching Relays Pos\Neg Trans Coil	✓ First Out Program ✓ Pos\Neg Trans Program	➢ LAB 4.1 First out latch ➢ LAB 4.2 Pos\Neg Trans
5	Time Delay	✓ Time Delay Programming	➢ LAB 5.1 Time Delays ➢ LAB 5.2 Motor Strt w TD
6	Time Delay	✓ Time Delay Program	➢ LAB 6.1 Motor sequence ON ➢ LAB 6.2 Motor sequence OFF ➢ Stop\Strt w LOP bypass
7	Time Delay	✓ Time Delay design and programming	➢ LAB 7.1 Traffic Light program…group design
8	Counter	✓ Counter Basics ✓ Programming	➢ Lab 8.1 Basic Programming ➢ Lab 8.2 Counter w ST\STR ➢ Lab 8.3 “Secret Code”
TEST			
9	Counter	✓ Counter Programming and Design	➢ LAB 9.1 Baseball Scoreboard
10	MOVE Function	✓ MOVE basics and design	➢ LAB 10.1 MOVE to a TD ➢ LAB 10.2 MOVE w ST\STR ➢ LAB 10.3 MOVE w LOP
11	MOVE Function	✓ MOVE programming and design	➢ LAB 11.1 “Double Stuff”
TEST			
12	Analogue	✓ Analogue inputs (AI) basics and design	➢ LAB 12.1 AI Basics ➢ LAB 12.2 LOP w Analogue
13	RANGE Function	✓ Basics of RANGE function	➢ Lab 13.1 LOP w Dial In RANGE
14	RANGE Function	✓ RANGE programming and design techniques	➢ Lab 14.1 “Molasses” Range project
15	RANGE Function	✓ RANGE programming and design techniques	➢ Lab 15.1 “BEER BARREL” Range project
16	SCALE Function	✓ SCALE basics and design techniques	➢ Lab 16.1 SCALE basic programming
17	Bit SET-CLR	✓ BIT basics and design techniques	➢ Lab 17.1 Bit SET/CLR basic programming
18	Rotate Left/Right	✓ ROR\ROL basics and design techniques	➢ Lab 18.1 ROR/ROL programming and design
19	Programming Design	✓ Programming	➢ Lab 19.1 “Hole Punch”
20	Programming Design	✓ Programming	➢ Lab 20.1 “Green House”
21	Programming Design	✓ Programming	➢ Lab 21.1 “ Car Wash”
22	Programming Design	✓ Programming	➢ Lab 22.1 “ Band Saw”
23	Programming Design	✓ Programming	➢ Lab 23.1 “ Pipe Cleaner”
FINAL TEST			

Expectations for Engagement – Face to Face Learning

To help make the learning experience fulfilling and rewarding, the following Expectations for Engagement provide the parameters for reasonable engagement between students and instructors for the learning environment. Students and instructors are welcome to exceed these requirements.

Reasonable Expectations of Engagement for Instructors

1. As an instructor, I understand the importance of clear, timely communication with my students. In order to maintain sufficient communication, I will
    - provided my contact information at the beginning of the syllabus;
    - respond to all messages in a timely manner through telephone, email, or next classroom contact; and,
    - notify students of any extended times that I will be unavailable and provide them with alternative contact information (for me or for my supervisor) in case of emergencies during the time I'm unavailable.

2. As an instructor, I understand that my students will work to the best of their abilities to fulfill the course requirements. In order to help them in this area, I will
    - provide clear information about grading policies and assignment requirements in the course syllabus, and
    - communicate any changes to assignments and/or to the course calendar to students as quickly as possible.

3. As an instructor, I understand that I need to provide regular, timely feedback to students about their performance in the course. To keep students informed about their progress, I will
    - return classroom activities and homework within one week of the due date and
    - provide grades for major assignments within 2 weeks of the due date or at least 3 days before the next major assignment is due, whichever comes first.

Reasonable Expectations of Engagement for Students

1. As a student, I understand that I am responsible for keeping up with the course. To help with this, I will
    - attend the course regularly and line up alternative transportation in case my primary means of transportation is unavailable;
    - recognize that the college provides free wi-fi, computer labs, and library resources during regular campus hours to help me with completing my assignments; and,
    - understand that my instructor does not have to accept my technical issues as a legitimate reason for late or missing work if my personal computer equipment or internet service is unreliable.

2. As a student, I understand that it is my responsibility to communicate quickly with the instructor any issue or emergency that will impact my involvement with or performance in the class. This includes, but is not limited to,
    - missing class when a major test is planned or a major assignment is due;
    - having trouble submitting assignments;
    - dealing with a traumatic personal event; and,
    - having my work or childcare schedule changed so that my classroom attendance is affected.

3. As a student, I understand that it is my responsibility to understand course material and requirements and to keep up with the course calendar. While my instructor is available for help and clarification, I will
    - seek out help from my instructor and/or from tutors;
    - ask questions if I don't understand; and,
    - attend class regularly to keep up with assignments and announcements.

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 abd 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.

Odessa College's Institutional Core Objectives (ICOs):

1) Critical Thinking Skills - to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
2) Communication Skills - to include effective development, interpretation and expression of ideas through written, oral and visual communication
3) Empirical and Quantitative Skills – to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions
4) Teamwork - to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal
5) Personal Responsibility - to include the ability to connect choices, actions and consequences to ethical decision-making
6) Social Responsibility - to include intercultural competence, knowledge of civic responsibility, and the ability to engage effectively in regional, national, and global communities