

Programmable Controllers (RBTC 1401) 1A1



**LAMAR INSTITUTE
OF TECHNOLOGY**

CREDIT

4 Semester Credit Hours (2 hours lecture, 4 hours lab)

MODE OF INSTRUCTION

Hybrid

PREREQUISITE/CO-REQUISITE:

CETT 1403 & CETT 1405

COURSE DESCRIPTION

A study in programmable logic controllers (PLC). Topics include processor units, numbering systems, memory organization, relay type devices, timers, counters, data manipulators, and programming.

COURSE OBJECTIVES

Upon completion of this course, the student will be able to

1. Write working programs using ladder logic
2. Install and troubleshoot the program
3. Integrate PLCs into electro-mechanical systems
4. Identify the main parts of a PLC and describe their function
5. Convert relay ladder schematics to ladder logic programs and program instructions that perform logical operations
6. Apply combinations of counter and timers to control systems

INSTRUCTOR CONTACT INFORMATION

Instructor: Patrick Reindel
Email: ptreindel@lit.edu
Office Location: PATC 232
Office Hours: Monday 30 minutes before and after class.
Other times available by appointment

REQUIRED TEXTBOOK AND MATERIALS

1. *Programmable Controllers, 5th Edition*, by Frank Petruzella, McGraw-Hill
2. Notebook.

ATTENDANCE POLICY

Students must be in class in order to complete lab activities for that day. Missing 20%, or more of classes will result in an automatic "F" for the course.

Approved: CH 1/15/2025

DROP POLICY

If you wish to drop a course, you are responsible for initiating and completing the drop process. If you stop coming to class and fail to drop the course, you will earn an "F" in the course.

COURSE CALENDAR (subject to change)

DATE	TOPIC	READINGS (Due on this Date)	ASSIGNMENTS (Due on this Date)
1/26/25	Course introduction, policies, and practice		Practice Assignments
1/27/25			LAB 1
1/27/25			LAB 2
2/2/25	PLCs: An Overview	Chapter 1	Blackboard Chapter Review
2/3/25			LAB 3
2/3/25			LAB 4
2/9/25	PLC Hardware	Chapter 2	Blackboard Chapter Review
2/10/25			LAB 5
2/14/25	Unit 1 Review	Chapters 1 & 2	Blackboard Quiz 1
2/16/25	Unit 1 Review	Chapters 1 & 2	Blackboard EXAM 1
2/17/25			LAB 6
2/17/25			LAB 6 (Programs)
2/23/25	Number Systems & Codes	Chapter 3	Blackboard Chapter Review
2/24/25			LAB 7
2/24/25			LAB 7
3/2/25	Fundamentals of Logic	Chapter 4	Blackboard Chapter Review
3/3/25			LAB EXAM 1 (Group A)
3/3/25			LAB EXAM 1 (Group B)
3/7/25	Unit 2 Review	Chapters 3 & 4	Blackboard Quiz 2
3/9/25	Unit 2 Review	Chapters 3 & 4	Blackboard EXAM 2
3/17/25			LAB 8
3/17/25			LAB 9
3/23/25	Basics of PLC Programming	Chapter 5	Blackboard Chapter Review
3/24/25			LAB 10
3/24/25			LAB 11
3/30/25	Wiring Diagrams &	Chapter 6	Blackboard Chapter Review
3/31/25			LAB EXAM 2 (Group B)
3/31/25			LAB EXAM 2 (Group A)
4/4/25	Unit 3 Review	Chapters 5 & 6	Blackboard Quiz 3
4/6/25	Unit 3 Review	Chapters 5 & 6	Blackboard EXAM 3
4/7/25			LAB 12
4/7/25			LAB 13
4/13/25	Programming Timers	Chapter 7	Blackboard Chapter Review
4/14/25			LAB 14
4/14/25			LAB 15
4/20/25	Programming Counters	Chapter 8	Blackboard Chapter Review
4/21/25			LAB EXAM 3 (Group A)
4/21/25			LAB EXAM 3 (Group B)

4/25/25	Unit 4 Review	Chapters 7 & 8	Blackboard Quiz 4
4/27/25	Unit 4 Review	Chapters 7 & 8	Blackboard EXAM 4
4/28/25			OPEN LAB
5/5/25	LAB FINAL REVIEW		LAB FINAL REVIEW
5/9/25	Final Exam		Blackboard Final Exam
5/12/25	LAB FINAL		LAB FINAL

COURSE EVALUATION

Final grades will be calculated according to the following criteria:

Labs- 50%

EXAMS*- 30%

Quizzes/Assignments- 20%

*There will be 4 major EXAMS and a FINAL EXAM. If you choose to *not* take the FINAL, your Exam Avg will be used as your FINAL EXAM grade.

GRADE SCALE

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

TECHNICAL REQUIREMENTS

The latest technical requirements, including hardware, compatible browsers, operating systems, etc. can be online at <https://lit.edu/online-learning/online-learning-minimum-computer-requirements>. A functional broadband internet connection, such as DSL, cable, or WiFi is necessary to maximize the use of online technology and resources.

DISABILITIES STATEMENT

The Americans with Disabilities Act of 1990 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. LIT provides reasonable accommodations as defined in the Rehabilitation Act of 1973, Section 504 and the Americans with Disabilities Act of 1990, to students with a diagnosed disability. The Special Populations Office is located in the Eagles' Nest Room 129 and helps foster a supportive and inclusive educational environment by maintaining partnerships with faculty and staff, as well as promoting awareness among all members of the Lamar Institute of Technology community. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409)-951-5708 or email specialpopulations@lit.edu. You may also visit the online resource at [Special Populations - Lamar Institute of Technology \(lit.edu\)](#).

STUDENT CODE OF CONDUCT STATEMENT

It is the responsibility of all registered Lamar Institute of Technology students to access, read, understand and abide by all published policies, regulations, and procedures listed in the *LIT Catalog and Student Handbook*. The *LIT Catalog and Student Handbook* may be accessed at www.lit.edu. Please note that the online version of the *LIT Catalog and Student Handbook* supersedes all other versions of the same document.

ARTIFICIAL INTELLIGENCE STATEMENT

Lamar Institute of Technology (LIT) recognizes the recent advances in Artificial Intelligence (AI), such as ChatGPT, have changed the landscape of many career disciplines and will impact many students in and out of the classroom. To prepare students for their selected careers, LIT desires to guide students in the ethical use of these technologies and incorporate AI into classroom instruction and assignments appropriately. Appropriate use of these technologies is at the discretion of the instructor. Students are reminded that all submitted work must be their own original work unless otherwise specified. Students should contact their instructor with any questions as to the acceptable use of AI/ChatGPT in their courses

STARFISH

LIT utilizes an early alert system called Starfish. Throughout the semester, you may receive emails from Starfish regarding your course grades, attendance, or academic performance. Faculty members record student attendance, raise flags and kudos to express concern or give praise, and you can make an appointment with faculty and staff all through the Starfish home page. You can also login to Blackboard or MyLIT and click on the Starfish link to view academic alerts and detailed information. It is the responsibility of the student to pay attention to these emails and information in Starfish and consider taking the recommended actions. Starfish is used to help you be a successful student at LIT.

ADDITIONAL COURSE POLICIES/INFORMATION

1. ALL work should be completed in PENCIL! Work submitted in pen will receive a ZERO.
 2. All communication should take place through my office phone or LIT Email (clhoke@lit.edu). If you message me through Blackboard, be sure to click the “send as an email also” button.
 3. No food, drinks, or use of tobacco products in class.
 4. No foul or harsh language will be tolerated
 5. Turn off all Cell Phones during lectures, unless otherwise instructed by me
 6. Take care of tools and equipment used during class
 7. Headphones may be worn only upon Instructor approval
 8. Do not bring children to class.
 9. No Cheating of any kind will be tolerated. Students caught cheating or helping someone to cheat can and will be removed from the class for the semester. Cheating can result from expulsion from LIT.
 10. If you wish to drop a course, the student is responsible for initiating and completing the drop process. If you stop coming to class and fail to drop the course, you will earn an ‘F’ in the course.
 11. Students must have access to, and knowledge of basic computer functions (including Blackboard)
 12. Students should check Blackboard daily.
 13. Internet Usage
 - a. Classroom computers have access to the internet.
 - b. Student usage of the internet will be monitored.
 - c. Proper usage of the internet will be allowed for classroom research, classwork, tests, and assignments as directed.
 - d. Any unauthorized usage of the Internet will not be tolerated.
 - e. Improper usage of the Internet, such as profanity, nudity, gambling, etc. will result in disciplinary action.
- 12. There will be a 20 point penalty for each day deducted from late work on Blackboard assignments. There will be NO make-up labs. Lab assignments turned in after the due date will NOT be graded.**
- 13. There will be NO make-up Exams. If you miss an Exam for any reason, you automatically forfeit your possible exemption from the Final.**