

Industrial Electronics: Lecture / ELMT 2333

INSTRUCTOR CONTACT INFORMATION

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**LAMAR INSTITUTE
OF TECHNOLOGY**

CREDIT

3:2:3 Semester Credit Hours (2 Hours Lecture, 3 hours Lab)

MODE OF TRUCTION

Face to Face

PREREQUISITE/CO-REQUISITE:

None.

COURSE DESCRIPTION

This course provides a study of devices, circuits, and systems used in industrial automation, manufacturing processes, and process control applications. Students develop an understanding of electrical and electronic circuits as they relate to industrial control systems and automated equipment.

The course emphasizes the analysis and application of electrical circuits, sensors, actuators, relays, motors, solid-state devices, programmable control technologies, and computer-based control systems. Students examine the interfacing of mechanical, electrical, electronic, and computer equipment commonly found in modern industrial environments. Topics include DC and AC circuit fundamentals, network analysis, power systems, electronic control devices, industrial instrumentation, signal conditioning, data acquisition, motor control circuits, programmable logic controllers (PLCs), industrial communications, and process control systems.

COURSE OBJECTIVES

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

1. Apply fundamental DC and AC circuit analysis techniques to industrial electronic systems.
2. Explain the operating principles of electronic devices commonly used in industrial automation and process control.
3. Analyze electrical networks using circuit laws, network theorems, and measurement techniques.
4. Interpret electrical schematics, ladder diagrams, wiring diagrams, and industrial control documentation.
5. Describe the functions and applications of sensors, transducers, and instrumentation used in industrial environments.

6. Analyze the operation of relays, contactors, timers, motor starters, and industrial control devices.
7. Explain the principles of interfacing mechanical, electrical, electronic, and computer-based systems.
8. Apply computer control concepts to industrial automation and manufacturing processes.
9. Develop and troubleshoot control circuits used in automated manufacturing systems.
10. Implement basic programmable logic controller (PLC) concepts for industrial control applications.
11. Analyze motor control systems and industrial power distribution circuits.
12. Utilize electronic measurement instruments to evaluate circuit performance and diagnose faults.
13. Evaluate signal conditioning and data acquisition methods used in industrial control systems.
14. Demonstrate safe work practices when operating and maintaining industrial electronic equipment.
15. Troubleshoot industrial electronic circuits and automated systems using systematic diagnostic techniques.

REQUIRED TEXTBOOK AND MATERIALS

1. Scientific calculator
2. Laptop
3. Textbook: "Fundamentals of Electric Circuits" By Charles K Alexander. Matthew N.O Sadiku, Steven J Fredette Edition ISBN- 978—1-265-46800-2
4. Textbook: "GROB'S BASIC ELECTRONICS" By Mitchel E. Schultz. Edition ISBN- 978—1-265-46800-2

ATTENDANCE POLICY

The campus policy mandates that students attend 80% of their scheduled instructional days. Class attendance is critical for understanding the topics. This will be tracked in Starfish via student access in Blackboard and participation during specified meeting times. Excessive unexplained absences will result in a ten-point penalty from the final semester grade (at the discretion of the instructor).

DROP POLICY

If you wish to drop a course, you are responsible for initiating and completing the drop process by the specified drop date as listed on the Academic Calendar. If you stop coming to class and fail to drop the course, you will earn an "F" in the course.

COURSE EVALUATION

Final grades will be calculated according to the following criteria:

Homework	20%
Assignments	20%
Quiz:	20%
Exam:	40%

GRADE SCALE

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

LIT does not use +/- grading scales

STUDENT EXPECTED REQUIREMENT

For every hour in class (or unit of credit) students should expect to spend at least two to three hours per week studying and completing assignments. For 3 credit hour class students should prepare to allocate approximately six to nine hours per week outside of class in a 16 week session or approximately twelve to eighteen hours in an 8-week session. Online/Hybrid students should expect to spend at least as much time in this course as in the traditional, face-to-face class.

ACADEMIC DISHONESTY

Students found to be committing academic dishonesty (cheating, plagiarism, or collusion) may receive disciplinary

action. Students need to familiarize themselves with the institution's Academic

Dishonesty Policy available in the Student Catalog & Handbook at

<http://catalog.lit.edu/index.php>

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 Wi-Fi 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](#)

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.

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 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.

COURSE ASSESSMENT

Quiz: A quiz will be given every other week. The duration of the quizzes will be 15 to 20 minutes. We will continue the class sessions after the quizzes. It is to make sure that the students are students are

studying the class materials on a regular basis.

Optional Homework: Students will regularly receive optional homework assignments. These assignments will not be graded. The purpose of the homework is to support the students' learning process.

Extra Credits: Extra credit opportunities will be announced during class lectures. The extra credits will be reflected on students overall grade points at the end of the semester.

Exams: Instructions and dates will be announced at least one week in advance. The calendar in the syllabus shows tentative dates.

ADDITIONAL COURSE POLICIES/INFORMATION

1. Any assignment that Blackboard considers late will be manually graded with a deduction of 20 points.
2. The Final Exam cannot be late for ANY reason. The semester ends when the Final Exam is due.
3. Changes will be made to the calendar's topics and assignments because of any unanticipated circumstances.

SYLLABUS SCHEDULE

The schedule below is the tentative semester schedule which is subject to revision.

Week	Topic	Reference
Week 1	Introduction to power • Introduction to powers	Introduction to powers – Questions and problems.
Week 2	Chapter 1- Electricity	Chapter 1- Questions and Problems
Week 3	Chapter 2: Resistors	Chapter 2- Questions and Problems
Week 4	Chapter 3,4 • Ohm's Law • Series Circuit	Chapter 3,4 Problems and Questions
Week 5	Chapter 5,6 • Parallel Circuit • Series- Parallel Circuits	Chapter 5,6 Problems and Questions
Week 6	Chapter 7,8 • Voltage and Current Dividers • Analog and Digital Multimeter	Chapter 7,8 Problems and Questions
Week 7	Chapter 9 Kirchhoff's Laws	Chapter 9 Problems and Questions
Week 8	First Order Circuits	Problems and Questions
Week 9	Second Order Circuits	Problems and Questions

Week	Topic		Reference
Week 10	Lab Project 1	Lab Work	
Week 11	Lab Project 2	Lab Work	
Week 12	Lab Project 3	Lab Work	
Week 13	Lab Project 4	Lab Work	
Week 14	Final Exam		

Notes:

- This schedule is tentative and subject to change