

# Physics of Instrumentation INCR 1402 6A1\_Spring\_2025

## 10613

### CREDIT

4 Semester Credit Hours (3 hours lecture, 4 hours lab)

### MODE OF INSTRUCTION

Face to Face

### PREREQUISITE/CO-REQUISITE:

MATH 1332

### COURSE DESCRIPTION

An introduction to simple control loops. Introduction to pressure, temperature, level, and flow transmitters. Introduction to transducers used in the detection of changes in process variables.

### COURSE OBJECTIVES

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

1. Demonstrate an understanding of process instruments and devices.
2. Understand and describe control loops.
3. Understand the control and detection of pressure, temperature, level, flow, pH, etc

### INSTRUCTOR CONTACT INFORMATION

Instructor:	Edgar Neely
Email:	efneely@lit.edu
Office Phone:	409-247-5105
Office Location:	PATC 208
Office Hours:	MW 2:30 – 5:00, additional hours posted on instructor's office door

### REQUIRED TEXTBOOK AND MATERIALS

1. Instrumentation 6th Edition by Franklyn W. Kirk, Thomas A Weedon, and Philip Kirk a.
2. ISBN number is 978-0-8-26934442-0 2.
3. Scientific Calculator
4. Notebook.

### ATTENDANCE POLICY

Regular attendance in class is important to achieve the educational objectives of the student and the Institute. Class attendance is restricted to those students registered for the course and to the guests invited by the instructor. Persons not properly registered for a course will not be permitted to attend class. Students are not permitted to bring any children to class. Children must not be left unattended on campus.



If a student misses more than 25% (approximately 8 classes) of the entire semester, they will earn a grade of “F”. There are no excused absences. If you are not in class that day, you will be counted absent.

If you find it necessary to leave class early please plan with me before class starts. Please do not leave the room during lecture. If you do leave, please do not re-enter the room until after lecture. This includes bathroom breaks. Take them before class.

### **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**

<b>DATE</b>	<b>TOPIC</b>	<b>READINGS (Due on this Date)</b>	<b>ASSIGNMENTS (Due on this Date)</b>
Week 1	Course intro/policies	None	None
Week 2	Introduction of Instruments and Temperature conversions.	Chapter 1	Classwork, lab safety
Week 3&4	Overview of industrial instrumentation and the principles of instruments, instrumentation diagrams, control and Temperature measurement	Chapter 1	Test 1
Week 5&6	Pressure • Lecture • Lab: Chapter Exercises and Workbook exercises	Chapter 9,10	Classwork/lab exercises
Week 7&8	Pressure • Lecture • Lab: Temperature conversions. Setup and calibration of differential pressure transmitters.	Chapter 11, 12	Test 2
Week 9&10	Level • Lecture • Lab: Chapter and workbook Exercises and bench calibrations. Tracings loops on unit.	Chapters 13,14,15	Classwork/lab exercises
Week 11&12	Lecture • Lab: Workbook Exercises Set- up and calibration of differential pressure transmitters for level measurement.	Chapter 16, 17	Test 3
Week 13	Flow • Lecture • Lab: Workbook Exercises	Chapters 18, 19, 20	Classwork/lab exercises
Week 14, 15, 16	Flow • Lecture • Lab: Workbook exercises and set-up of flow transmitters. Implementation of temperature transmitters to measure flow.	Chapter 21, 22	End of chapter work Test 4

## **COURSE EVALUATION**

Final grades will be calculated according to the following criteria:

- Exams 70% May include lecture and lab exams
- All other work 30% Classwork, Homework, and Labs

## **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](mailto: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](http://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 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

\*\*\*\*\***NO MAKEUP WORK AND NO LATE WORK WILL BE ACCEPTED.**\*\*\*\*\*

### CLASSWORK:

Classwork will be done in class or due at the beginning of the next class period if it is a take home. If you are not here that day, or you do not turn the work in, then you will receive a zero.

### HOMEWORK:

Homework from questions at end of each chapter of textbook will be assigned. Each homework assignment will be due on the day of the exam. Example. Chapter One homework will be due on the day that Chapter One exam is administered. If it is not turned in by due date, you will receive a zero.

### LABWORK:

Lab work will be done in class. If you are not here that day, then you will receive a zero.

Absolutely no talking during an exam. (**no excuses**)

**Cell phones are not to be seen during lecture.** You may be asked to leave the classroom if they ring. Cell phones **may not** be used as calculators. **No texting** during class.

Make sure that when finished with lab, you turn power off to meters and the lab station, and clean up your work area.

### ACADEMIC DISHONESTY:

“Academic dishonesty, which includes but is not limited to cheating on an examination or other academic work to be submitted, plagiarism, collusion, or abuse of resource materials, is subject to disciplinary action.

“Students found responsible for an act or acts of academic dishonesty may be subject to either academic sanctions or disciplinary sanctions. Academic sanctions may include, but are not limited to one or more of the following: performance of additional work, withdrawal from the course with a grade of “F”, and/or a reduction of a grade in the course.”

## Classroom Policies

**Violation of any of the following policies may result in the student being dismissed from class.**

- 1) Absolutely no talking during an exam. (**no excuses**)
- 2) **Cell phones are not to be seen during lecture.** You may be asked to leave the classroom if they ring. Cell phones may not be used as calculators. **No texting** during class.
- 3) No loud talking or disruptive behavior during class.
- 4) Cheating.
- 5) Cleaning up your **mess** and returning of **tools** to their proper place.
- 6) Stealing.
- 7) Intentional destruction of property.

IF YOU HAVE ANY QUESTIONS, ASK NOW!!!

## Course Schedule

Week	Assignment/Activities	Due Date	Location
1	Cover Syllabus Introduction Discussion Assignments Tests	01/21/2025 8-11am	Getting Started
2	Review Ch-1,2&3 Lab work Assignment 1	01/23/2025 8-11AM	Text Book Ch-1,2&3
3	Temperature Review Ch-4 - 8 Assignment 2	01/30-02/05/2025 8-11AM	Text Book Ch-4-8
4	Temperature Test 1	02/13/2025 8-11AM	Classroom 228
5	Pressure Review Review Ch 9-12 CH-4	02/18-19/2025 8-11AM	Text Book Ch-9-12
6	Pressure Chapter 9-12 Review Assignment 3 Lab work	02/25-27/2025 8-11AM	Text Book Ch-9-12
7	Pressure Chapter 9-12 Review Assignment 4 Lab work	03/04-11/2025 8-11AM	Text Book Ch-9-12
8	Test-2 Pressure Ch 9-12	03/13/2025 8-11AM	Classroom 228
9	Level Review Ch-13-17 Assignment-5	03/18-27/2025 8-11AM	Text Book Ch-13-17
10	Level Chapter 13-17 Lab Work	04/01-03/2025 8-11AM	Text Book Ch-13-17 Classroom 228

11	Level Chapter 5 Review Lab Assignment Assignment-6	04/08/2025 8-11AM	Classroom 228
12	Test-3 Level	04/10/2025 8-11AM	Classroom 228
13	Review Ch-18-22 Flow	04/15-17/2025 8-11AM	Ch-18-22 Flow
13	Flow Lab work Ch 18-22	04/22-24/2025 8-11AM	Classroom 228 Ch-18-22
14	Ch- 18-22 Assignment-7	05/06-08/2025 8-11AM	Classroom 228 Ch-18-22
15	Ch18-22 Assignment-8	05/13/2025 8-11AM	Classroom 228 Ch-18-22
16	Flow Test- 4 Ch18-22	05/13/2025 8-11AM	Ch-18-22 Classroom 228