

Physics of Instrumentation (INCR 1402 6A1)

CREDIT

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

MODE OF INSTRUCTION

Hybrid

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: Thomas Bonds

Email: tmbonds@lit.edu

Office Hours: Tuesdays and Thursdays 30 minutes before/after class

REQUIRED TEXTBOOK AND MATERIALS

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

Approved: CH 01/20/2023



**LAMAR INSTITUTE
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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

DATE	TOPIC	READINGS (Due on this Date)	ASSIGNMENTS (Due on this Date)
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 9,10	Classwork/lab exercises
Week 7&8	Pressure • Lecture • Lab	Chapter 11, 12	Temperature conversions. Setup and calibration of differential pressure transmitters. Test 2
Week 9&10	Level • Lecture • Lab	Chapters 13,14,15	Classwork/lab exercises Bench calibrations. Tracings loops on unit.
Week 11&12	Level • Lecture • Lab	Chapter 16, 17	Workbook Exercises Set- up and calibration of differential pressure transmitters for level measurement. Test 3
Week 13	Flow • Lecture • Lab	Chapters 18, 19, 20	Classwork/lab exercises
Week 14, 15, 16	Flow • Lecture • Lab	Chapter 21, 22	Workbook exercises and set-up of flow transmitters. Implementation of temperature transmitters to measure flow. Test 4

COURSE EVALUATION

Final grades will be calculated according to the following criteria:

- Exams 80% May include lecture and lab exams
- All other work 20% 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. 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.

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.”