

## Measure and Process Control Theory INCR 1442 6A1

### CREDIT

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

### MODE OF INSTRUCTION

Face to Face

### PREREQUISITE/CO-REQUISITE:

INCR 1402 and CETT 1405

### COURSE DESCRIPTION

A study of the basic principles of process automation and their applications including basic control concepts, feedback control, sensors and transmission systems, controllers, control valves, process dynamics, tuning control systems, and cascade ratio.

### COURSE OBJECTIVES

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

1. Demonstrate an understanding of process dynamics.
2. Illustrate basic control concepts.
3. Tune control systems
4. Operate a Smart Communicator.
5. Use a Smart Communicator to calibrate a Smart Transmitter.
6. Configure a Digital Controller.
7. Wire an instrument loop with a transmitter, controller and digital recorder.
8. Operate the Instrument Loop on manual and automatic.
9. Tune the controller using Gain, Integral, and Derivative.

### INSTRUCTOR CONTACT INFORMATION

Instructor: Steve Champagne

Email: smchampagne@lit.edu

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

### REQUIRED TEXTBOOK AND MATERIALS

1. *Instrumentation 6<sup>th</sup> Edition* by Franklyn W. Kirk, Thomas A Weedon, and Philip Kirk, American Technical Publishers
  - a. ISBN number is 978-082-693-442-0
2. Scientific Calculator
3. Notebook.

Approved: CH 01/20/2023



**LAMAR INSTITUTE  
OF TECHNOLOGY**

## ATTENDANCE POLICY

1. Missing 20% (3) or more of classes may result in the loss of two letter grades from your final semester average.
2. Missing more than 20% of a class period will count as an absence

## 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)
Week 1	Course intro/policies	None	Classwork, lab safety
Week 2	Automatic Control and Process Dynamics	Chapter 35	Auto/Manual Labs
Week 3/4	Control Strategies	Chapter 36	Lab Basics & Dumb Xmtr
Week 5	Unit 1 Review	Chapter 35 & 36	<b>Exam 1</b>
Week 6	Controller Tuning	Chapter 37	Tuning Lab
Week 7	Digital Controllers	Chapter 38	Function Block Logic Lab
Week 8	Unit 2 Review	Chapter 37 & 38	<b>Exam 2</b>
Week 9	Control Valves	Chapter 39	Relay & Schematics Lab
Week 10	Actuators & Positioners	Chapter 41	HART Comm/Valve Lab
Week 11	Unit 3 Review	Chapter 39 & 41	<b>Exam 3</b>
Week 12	Safety Devices	Chapter 43	Dumb Xmtr Calibration Lab
Week 13	Electrical Safety Standards/SIS	Chapter 44 & 45	PNID Lab
Week 14	Unit 4 Review	Chapters 43, 44, & 45	<b>Exam 4</b>
Week 15	Final Review	ALL	
Week 16	FINAL EXAM	ALL	FINAL EXAM

## COURSE EVALUATION

Final grades will be calculated according to the following criteria:

- Exams- 50%
- Labs- 30%
- Daily Assignments & Quizzes- 20%

## 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**

1. No food, drinks, or use of tobacco products in class.
2. No foul or harsh language will be tolerated
3. Turn off all Cell Phones during lectures, unless otherwise instructed by me
4. Clean up work station after you complete your lab assignments. Materials left at work station will result in 5 points deducted from that lab assignment.
5. Take care of tools and equipment used during class, blowing fuses or tripping breakers will result in a 20% deduction from Lab work.
4. Headphones may be worn only upon Instructor approval
5. Do not bring children to class.
6. 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.
7. 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.
8. Students must have access to, and knowledge of basic computer functions (including Blackboard)
9. Students should check Blackboard daily.
10. 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.
11. **There will be a 20 point penalty for each class period deducted from late work.**
12. **There will be NO make-up Exams. If you miss an Exam for any reason, you automatically forfeit your possible exemption from the Final.**
13. **Exams are timed on Exam Day, once the clock has started that is the time allowed. If you are late to class you have only the time remaining to complete the test.**