

## **Pumps, Compressors & Mechanical Drives (INMT 2303)**



**Credit:** 3 semester credit hours (2 hours lecture, 4 hours lab)

**Prerequisite/Co-requisite:** INMT 1305

### **Course Description**

A study of the theory and operations of various types of pumps and compressors. Topics include mechanical power transmission systems including gears, v-belts, and chain drives.

### **Required Textbook and Materials**

1. *Audel Millwrights & Mechanics Guide* by Davis & Nelson, 5<sup>th</sup> edition.
  - a. ISBN number is 0-7645-4171-1
2. Equipment to be furnished by students: Required at instructor discretion.
  - a. Safety Glasses (Z 87+)
  - b. Gloves (leather or equal)
  - c. Long pants and long sleeve shirt
  - d. Shoes or Boots (substantial leather or equal w/ heels - no open toes)

### **Course Objectives**

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

1. Identify the principles involved in the operation of centrifugal and positive displacement pumps and compressors.
2. Identify and explain the function of various components in pumps and compressors.
3. Disassemble and correctly reassemble pumps, compressors and mechanical drives.
4. Troubleshoot pumps, compressors and mechanical drives.

### **Course Outline**

- |   |                                      |
|---|--------------------------------------|
| I. Introduction                         | VI. Types of Mechanical Drives       |
| A. Faculty                              | A. Types of mechanical drives        |
| II. Course Safety                       | B. Uses of mechanical drives         |
| A. Safety in Lab                        | VII. Pumps, Compressors, and Drives  |
| B. Safety when using tools              | A. Components of Pumps,              |
| III. Principles of Compressor Operation | Compressors and drives               |
| A. How compressors work                 | B. Similarity of Pumps,              |
| B. Uses of compressors                  | Compressors and Drives               |
| IV. Compressor Types                    | VIII. Rebuilding Pumps, Compressors, |
| A. Centrifugal Compressors              | and Mechanical Drives                |
| B. Reciprocating Compressors            | A. Disassemble and rebuild one of    |
| V. Pump Types                           | each                                 |
| A. Centrifugal Pumps                    | B. Discuss rebuild techniques used.  |
| B. Reciprocating Pumps                  |                                      |

Approved 12/2013

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Course Syllabus

- IX. Troubleshooting Pumps, Compressors, and Mechanical Drives
  - A. The need for troubleshooting
  - B. The techniques
- X. Equipment Testing
  - A. The techniques used to test equipment
- XI. Evaluation
  - A. Student Safety
  - B. Student Work
- B. How to test a piece of equipment

**Grade Scale**

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

**Course Evaluation**

Final grades will be calculated according to the following criteria:

<i>Activity</i>	<i>Percentage</i>
Major test	75%
Class participation	25%

**Course Requirements**

1. Disassemble and reassemble pumps
2. Disassemble and reassemble compressors
3. Assemble a mechanical drive
4. Troubleshoot a mechanical drive system

**Disabilities Statement**

The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. Among other things, these statutes require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409) 880-1737 or visit the online resource:

<http://www.lit.edu/depts/stuserv/special/defaults.aspx>

**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) or obtained in print upon request at the Student Services Office.

## 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.



## Course Schedule

Week	Topic	Reference
1	Course introduction and policies <ul style="list-style-type: none"><li>• Lecture</li><li>• Lab: Practice Drawing</li><li>• Test 1</li></ul>	Handouts
2	Introduction to Pumps <ul style="list-style-type: none"><li>• Lecture</li><li>• Lab: Practice</li></ul>	Chapter 25
3-6	Pump disassembly & Reassembly <ul style="list-style-type: none"><li>• Lecture</li><li>• Lab: Practice</li><li>• Test 2</li></ul>	Chapter 25
7	Introduction to Compressors <ul style="list-style-type: none"><li>• Lecture</li><li>• Lab: Practice</li></ul>	Chapter 26
8-10	Compressor disassembly and Reassembly <ul style="list-style-type: none"><li>• Lecture</li><li>• Lab: Practice</li></ul>	Chapter 26

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<b>Week</b>	<b>Topic</b>	<b>Reference</b>
	<ul style="list-style-type: none"><li>• Test 3</li></ul>	
11-16	Understanding Mechanical drives <ul style="list-style-type: none"><li>• Lecture</li><li>• Lab: Bench Practice</li><li>• Final Exam</li></ul>	Chapters 10,11,12,13,14,15,16,17