

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, 5th edition.
 - a. ISBN number is 0-7645-4171-4
2. Equipment to be furnished by students:
 - a. Hard Hat (red)
 - b. Hearing protection (Ear plugs or Muffs 29 NRR+)
 - c. Fire retardant clothing (Nomex or equal)
 - d. Safety Glasses (Z87+)
 - e. Gloves (leather or equal)
 - f. 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

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

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- A. Disassemble and rebuild one of each
- B. Discuss rebuild techniques used.
- 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
- B. How to test a piece of equipment
- XI. Evaluation
 - A. Student Safety
 - B. Student Work

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

Attendance Policy

1. Students in a 2 day class are allowed 2 unexcused absences.
2. An absence, excused or unexcused is counted 6 points off the final grade.
3. More than 2 unexcused absences can result in an “F” in the course.
4. Being tardy 3 times equals 1 absence. (2 points each)
5. Students in a 1 day class are allowed 1 unexcused absence.(12 points off the final grade)

Course Policies

Students must possess and present LIT ID to attend class.

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
4. Headphones may be worn only upon Instructor approval

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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. Proper Dress. **Any intentional display of undergarments will not be tolerated and can result in the student being removed from the class. Pants will be worn belted at the waist as to allow the student to walk, climb, stoop and bend as required.** It is the student's responsibility to dress for work as if in an industrial environment, long pants, shirts with sleeves, substantial footwear (full leather shoes or boots with heels, composition oil resistant soles, no sandals, flip flops, cloth shoes). Safety glasses and hard hats will be necessary as the class requires.
9. 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. Used for classroom research or as directed.
 - d. Any unauthorized use of the internet will not be tolerated.
 - e. Improper usage of the internet, such as profanity, pornography, gambling, etc... will result in disciplinary action not limited to expulsion from LIT.

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 office in Student Services, Cecil Beeson Building.

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

Course Schedule

Week	Topic	Reference
1	Course introduction and policies <ul style="list-style-type: none">• Lecture• Lab: Practice Drawing	Handouts

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Week	Topic	Reference
	<ul style="list-style-type: none">• Test 1	
2	Introduction to Pumps <ul style="list-style-type: none">• Lecture• Lab: Practice	Chapter 25
3-6	Pump disassembly & Reassembly <ul style="list-style-type: none">• Lecture• Lab: Practice• Test 2	Chapter 25
7	Introduction to Compressors <ul style="list-style-type: none">• Lecture• Lab: Practice	Chapter 26
8-10	Compressor disassembly and Reassembly <ul style="list-style-type: none">• Lecture• Lab: Practice• Test 3	Chapter 26
11-16	Understanding Mechanical drives <ul style="list-style-type: none">• Lecture• Lab: Bench Practice• Final Exam	Chapters 10,11,12,13,14,15,16,17

Contact Information:

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Office Hours: 4:30 am -5:30 pm Tues/Thurs