

## Industrial Power Plant Systems (INMT 1355)



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

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

### Course Description

A study of the principles of operation and maintenance of industrial power plants. The major engine systems will be studied. Emphasis will be placed on component replacement, tune-up, and field adjustments.

### Required Textbook and Materials

1. *Audel Millwrights & Mechanics Guide* by Davis & Nelson, 5<sup>th</sup> edition

ISBN: 0-7645-4171-1.

1. 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. Describe the principles of operation for gasoline, diesel, and steam turbine industrial engines.
2. Identify the major components in all three types of engines.
3. Explain the functions of the four engine systems: air, fuel, cooling, and lubrication.
4. Perform minor repairs including component assembly replacement, tune-up, and adjustments.)
5. Perform routine maintenance and inspection on industrial engines.

### Course Outline

1. Safety
  - a. Safety in Lab
  - b. Safety in tool use
2. Types of turbines
  - a. Types of turbines
  - b. Turbines in the lab
3. Steam type turbines
  - a. Steam Safety requirements
  - b. Uses of Steam Turbines
4. Gas type turbines
  - a. Gas Safety requirements
  - b. Uses of Gas Turbines
5. Engine systems
  - a. Gasoline engine systems
  - b. Diesel engine systems
6. Turbine repair
  - a. Disassembly and parts of a turbine
  - b. Reassembly and balance of turbines
7. Seals and rings
  - a. Purpose of seals

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- b. Purpose of rings
- 8. Governor systems
  - a. Governor System?
  - b. How does the system work?
- 9. Trip mechanisms
  - a. What is a Trip?
  - b. How does the Trip work?
- 10. Tune-up and adjustments
  - a. What is a Tune-up?
- b. Who does the Tune-up?
- 11. Maintenance and inspection
  - a. What is required Maintenance?
  - b. Who does the inspections?
- 12. Safety and testing
  - a. What are the dangers in testing a turbine
  - b. Run and test turbine

**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%

Late Penalties will be assessed on all work turned in late. 5 points per day

**Course Requirements**

1. Identify Industrial Power Plants in Lab
2. Remove and Disassemble selected units
3. Reassemble and Install selected units

**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</li></ul>	Handouts
2	Introduction to Power Plant Systems <ul style="list-style-type: none"><li>• Lecture</li><li>• Lab: Practice</li></ul>	Lab
3	Basic Tool Box <ul style="list-style-type: none"><li>• Lecture</li><li>• Lab: Practice Tool Identification</li><li>• Test 1</li></ul>	Chapter 3
4	Mechanical Fasteners	Chapter 8

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<b>Week</b>	<b>Topic</b>	<b>Reference</b>
	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Lab: Practice</li> </ul>	
5	Lubrication and Oil Analysis <ul style="list-style-type: none"> <li>• Lecture</li> <li>• Lab: Practice</li> </ul>	Chapter 19
6	A/C Motors <ul style="list-style-type: none"> <li>• Lecture</li> <li>• Lab: Practice</li> <li>• Test 2</li> </ul>	Chapters 23/24
7/8	Gasoline Engines <ul style="list-style-type: none"> <li>• Lecture</li> <li>• Lab: Practice</li> </ul>	Lab
	Diesel Engines <ul style="list-style-type: none"> <li>• Lecture</li> <li>• Lab: Practice</li> <li>• Test 3</li> </ul>	Lab
11/12	Turbines <ul style="list-style-type: none"> <li>• Lecture</li> <li>• Lab: Practice</li> </ul>	Lab
13-16	Preventive & Predictive Maintenance <ul style="list-style-type: none"> <li>• Lecture</li> <li>• Lab: Practice</li> <li>• Final Exam</li> </ul>	Chapter 21