Industrial Troubleshooting (INMT 2345)

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

Prerequisite/Co-requisite: CNSE 1371

Course Description

An advanced study of the techniques used in troubleshooting various types of industrial equipment to include mechanical, electrical, hydraulic, and pneumatic systems and their control devices. Emphasis will be placed on the use of schematics and diagrams in conjunction with proper troubleshooting procedures.

Required Textbook and Materials

1. *Audel Mechanics & Millwrights Guide* by Davis & Nelson 5th
2. ISBN number is 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. Demonstrate a working knowledge of various troubleshooting techniques
2. Properly troubleshoot hydraulic, pneumatic, and electrical systems using schematics and diagrams
3. Troubleshoot mechanical drive systems

Course Outline

I. Troubleshooting techniques and safety
   A. Techniques of troubleshooting
   B. Discuss the safety required when troubleshooting equipment

II. Hydraulics and safety
   A. Discuss what Hydraulic forces are
   B. Discuss the dangers of hydraulics
   C. Complete exercises on hydraulics

III. Pneumatics and safety
   A. Discuss what Pneumatic forces are
   B. Discuss the dangers of Pneumatics
   C. Complete exercises on Pneumatics

IV. Electrical systems and safety
   A. Discuss the types of Electrical Systems
   B. Discuss the dangers in each system
   C. Complete exercises in electrical systems

V. Electrical schematics

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A. Discuss and Identify what schematics are
B. Demo the use of a schematic
C. Read and follow a schematic

VI. Gears and safety
A. Discuss the use of Gears
B. Discuss the dangers of gears
C. Complete exercises on Gears

VII. V-belt drives and safety
A. Discuss what V-belt drives are
B. Discuss the dangers of V-Belts
C. Complete exercises on V-Belts

VIII. Flat belts and safety
A. Discuss what and how Flat belts work
B. Discuss the dangers of Flat belt

IX. Pulleys and safety
A. Discuss what pulleys are and do
B. Discuss the dangers of Pulleys
C. Complete exercises on Pulleys

X. Chain drives and safety
A. Discuss what chain drives are and how they work
B. Discuss the dangers of chain and sprocket drives
C. Complete exercises on Chain Drives

XI. Couplings and safety
A. Discuss what couplings are and how they are used.
B. Discuss the dangers of using couplings
C. Complete exercises on Couplings

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:

Activity	***Percentage***
Major test	75%
Class participation	25%
Total	***100%***

Course Requirements

1. Developing Troubleshooting techniques
2. Practicing safety and Lock out / tag out
3. Practice the principles of preventive and predictive maintenance

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 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 • Lecture • Lab: Practice	Handouts
2	Introduction to Troubleshooting • Lecture • Lab: Practice • Test 1	Chapter 1
3	The Basic Toolbox • Lecture • Lab: Practice	Chapter 3
4	Using Power Tools • Lecture • Lab: Practice • Test 2	Chapter 4/5
5	Machinery and Equipment Inspection • Lecture • Lab: Practice • Test 3	Chapter 9
6-8	Understanding Bearings • Lecture • Lab: Practice • Test 4	Chapter 10
9/10	Application of Belts • Lecture • Lab: Practice • Test 5	Chapters 13/14
11	Application of Chain Drives • Lecture • Lab: Practice • Test 6	Chapter
12	Application of Gears • Lecture • Lab: Practice • Test 7	Chapter16
13-16	Troubleshooting Mechanical Drives Lab • Lecture • Lab: Practice • Final Exam	