Course Information

Division: Industrial Technology Education
Course Number: IPT 160
Title: Machinery Maintenance and Troubleshooting
Credits: 3
Developed by: M. Crockett
Lecture/Lab Ratio: 1 Lecture/4 Lab
Transfer Status: Pending evaluation
Activity Course: No
CIP Code: 47.0303
Assessment Mode: Pre/Post Test (50 Questions/100 Points)
Semester Taught: Spring
GE category: None
Separate Lab: No
Awareness Course: No
Intensive Writing Course: No

Prerequisites
IPT 140 with a grade of “C” or higher or concurrent enrollment in IPT 140

Educational Value
A. To general education: None
B. To other courses or curricula: this course is a curriculum requirement for the Industrial Plant Technician certificate.

Description
This course teaches systematic methods of identifying causes of mechanical failure and using predictive methods to prevent mechanical failure.

Supplies
None
**Competencies and Performance Standards**

1. **Use resources to understand equipment**
   
   **Learning Objectives**
   
   *What you will learn as you master the competency:*
   
   a. understand blueprints and drawings
   b. understand manufacturer’s guides
   c. analyze operators’ reports

   **Performance Standards**
   
   *Competence will be demonstrated:*
   
   - in class discussion
   - group projects
   - using sample resources
   - on written tests

   *Performance will be satisfactory when:*
   
   - learner completes written test to 70% correct
   - learner applies resource knowledge to complete assigned task

2. **Use maintenance history to understand equipment**
   
   **Learning Objectives**
   
   *What you will learn as you master the competency:*
   
   a. perform electrical analysis
   b. measure and record vibration signature
   c. track thermal changes
   d. perform oil analysis

   **Performance Standards**
   
   *Competence will be demonstrated:*
   
   - in class discussion
   - group practice
   - using model systems
   - on written tests

   *Performance will be satisfactory when:*
   
   - learner completes written test to 70% correct
   - learner applies resource knowledge to complete assigned task

3. **Define operation requirements for mechanical equipment**
   
   **Learning Objectives**
   
   *What you will learn as you master the competency:*
   
   a. determine electrical requirements
   b. determine load capacity
   c. determine RPM capacity
   d. locate power lockout
e. inspect bearings  
f. inspect seals  
g. inspect gears  
h. check shaft alignment  
i. inspect fluid levels  

**Performance Standards**  
*Competence will be demonstrated:*  
- in class discussion  
- group practice  
- using sample machinery  
- on written tests  

*Performance will be satisfactory when:*  
- learner completes written test to 70% correct  
- learner correctly completes inspection and adjustment tasks

4. **Use root cause analysis to analyze mechanical failure**  

**Learning Objectives**  
*What you will learn as you master the competency:*  
- list possible causes of excessive vibration  
- list possible causes of overheating  
- identify the types and causes of bearing failure  
- identify the causes of seal failure  

**Performance Standards**  
*Competence will be demonstrated:*  
- in class discussion  
- troubleshooting lab  
- using sample equipment  
- on written tests  

*Performance will be satisfactory when:*  
- learner completes written test to 70% correct  
- learner correctly identifies root causes of equipment failure

5. **Scheduling preventative maintenance**  

**Learning Objectives**  
*What you will learn as you master the competency:*  
- identify maintenance needs of a specific system  
- schedule maintenance tasks to prevent failure/maximize equipment life and productivity  

**Performance Standards**  
*Competence will be demonstrated:*  
- in class discussion
using model system
individual project
written tests

Performance will be satisfactory when:
- learner completes written test to 70% correct
- learner completes written preventative maintenance plan

Types of Instruction
Lecture/modeling
Lab assignments
Group practice
Individual projects

Grading Information
Assignments
Labs—50%
Written reports and tests—50%

Grading Scale
A=90-100%
B=80-89%
C=70-79%
D=60-69%
F=0-59%