

COURSE INFORMATION

COURSE PREFIX/NO: **IMT 163**

COURSE TITLE: **Problem Solving for Mechanical Applications**

LEC HRS/WEEK: 1.0

LAB HRS/WEEK: 6.0

CREDIT HRS/SEMESTER: 3.0

DL ATTENDANCE/VA STATEMENT TEXTBOOK INFORMATION

COURSE DESCRIPTION:

This course covers trouble-shooting techniques, such as math calculations and mechanical procedures.

COURSE COMPETENCIES:

Upon successful completion of this course the student will have demonstrated understanding of such concepts as work, force, motion and pitch ratios of revolving mechanisms by applying the following procedures:

- Demonstrate ability to use logic in determining the nature of a problem
- Use systematic method to determine the cause of a problem
- Determine if a possible corrective action for the cause of the problem exists
- Determine proper corrective action for the problem
- Solve the problem
- Calculate rotational speeds by using pitch ratios of gears, pulleys, and sprockets
- Compute speeds of compounded/complex reductions
- Use simple machines such as the lever, pulley, wedge to define horsepower & torque
- Employ senses (sight, feel, smell, sound, and touch) as trouble shooting practices
- Demonstrate familiarity with vibration parameters that would require correction procedures.

PERFORMANCE OBJECTIVES:

Given appropriate instruction the student will demonstrate capability to successfully perform each of the following projects. Success in these projects will be determined by instructor observation, instructor checklist, and/or physical evidence of success.

1. Calculate speeds of drive components in a specific speed reducer.
2. Calculate speeds of drive components in a compounded/complex drive unit.
3. Given examples of levers, pulleys, and wedges, student will calculate work advantages as they relate to horsepower and torque.
4. Given simulators/machines the student will employ the five senses to pin-point problems.
5. Given parameters for vibration analysis, the student will demonstrate procedure to measure them and procedure for correcting the cause(s) of the vibrations.

COURSE REQUIREMENTS:

Employers need people who will be on the job when needed, be prepared to work, be able to work, get along with their supervisor and fellow employees, and who are willing to do whatever is necessary to get the job done and done well.

This means the employee must have the knowledge and the capability and, just as important, have the character and attitude that are necessary to enable the employee to "fit" into the organization.

ATTENDANCE POLICY

Anyone absent more than 20% of the scheduled course hours will be withdrawn from the class according to school policy as outlined in the school catalog. If a student is tardy (arrives after roll call or is late returning from break) as many three times it will count as one hour of absence.

The fourth time and each time the student is tardy after that will count as one hour of absence. If a student leaves the class early without the instructor's approval it will count as one hour, or more, of absence (depending on how early).

ACADEMIC HONESTY

Any student caught cheating or involved in other academic dishonesty will receive an "F" grade for the course and may be subject to further disciplinary action.

GRADING

Based on this concept, students in industrial maintenance will be graded on the following:

Citizenship (See Separate Handout)
Competencies and performance based objectives
Academic knowledge

CITIZENSHIP WILL COUNT 20% OF THE TOTAL COURSE GRADE

Competencies listed above are skills the student is expected to possess before he/she completes the course. They will be included as part of the grading criteria for tests and performance based objectives at appropriate times throughout the course.

For successful completion of the course, the student must score a minimum of 70% on each performance based objective.

PERFORMANCE BASED OBJECTIVES WILL COUNT 40% OF THE TOTAL GRADE

TESTING

The student will be tested a minimum of three times during the course. Tests may be "open book", "closed book" or both at instructor's option. Minimum passing score for test is 70%.

TEST GRADES WILL COUNT 40% OF THE TOTAL COURSE GRADE.

The minimum passing score for the course is 70%. The grading scale is as follows:

Grade	Points
A	92.6 - 100
B	85.1 - 92.5
C	77.6 - 85
D	77.5 - 70

Evaluation Method

Written/Verbal Test	40%
Performance Objective	40%
Citizenship	20%

Any project or examination not completed will result in a grade of "incomplete" which will become "F" if the project or examination is to completed within 6 weeks of the semester. Make-up work will be scheduled at the instructor's convenience.

ENTRY LEVEL SKILLS:

A student entering this course should have an appropriate entrance score indicating an understanding of shop math and mechanical aptitude demonstrating interest in industrial mechanics.

PREREQUISITES: None.

CO-REQUISITES: None.

TOPIC/CONTENT OUTLINE:

- Useful work
 - Machine Efficiency
 - Factors
- Ratios
 - Reduce
 - Gear
- Machines
 - Simple
 - Purpose
 - Types
 - Use Examples
 - Efficiency
- Forces
 - Friction
 - Gravity
 - Weight
 - Inertia
- Equilibrium
 - Definition
 - Importance
 - Effect on Various Machines
- Motion
 - Basic Principles
 - Laws
 - Velocity
 - Acceleration
 - Inertia
- Types
 - Linear
 - Circular
- Vibration
 - Causes
 - Effect
 - Corrections
- Testing

METHOD OF INSTRUCTION:

Formal classroom discussion, using book, components, and appropriate training aids, interspersed with "hands on" shop work for reinforcement.