I. **OVERVIEW**

The following information will appear in the 2010 - 2011 catalog

INTEC 261 *Introduction to Plant Maintenance* 3 Units

An introduction to fundamental maintenance principles, procedures, practices and troubleshooting principles for equipment and systems in modern industrial and processing plants. Formerly listed as INDED 361.

Field trips might be required. (A-F Only) Lecture

Transfer: (CSU)

II. **LEARNING CONTEXT**

Given the following learning context, the student who satisfactorily completes this course should be able to achieve the goals specified in Section III, Desired Learning:

A. **COURSE CONTENT**

1. **Required Content:**

   a. Maintenance Principles
   b. Safety
   c. Service and repair principles
   d. Electrical systems
   e. Electronics and PLC's
   f. Mechanical Systems
      i. Bearings
      ii. Belts
      iii. Gears
   g. Fluid power systems
   h. Troubleshooting

2. **Recommended Content:**

   a. Refrigeration systems
   b. Boiler systems
   c. HVAC systems
B. **HOURS AND UNITS**

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C. **METHODS OF INSTRUCTION (TYPICAL)**

Instructors of the course might conduct the course using the following methods:

1. Classroom instruction.
2. Computer based tutorials.
3. Equipment and technology demonstrations.
4. Video presentations.
5. Field trip.
6. Guest speaker.

D. **ASSIGNMENTS (TYPICAL)**

1. **EVIDENCE OF APPROPRIATE WORKLOAD FOR COURSE UNITS**

   Time spent on coursework in addition to hours of instruction (lecture hours)

   a. Weekly homework/chapter reading.
   b. Weekly workbook assignments.
   c. Examination preparation and study.

2. **EVIDENCE OF CRITICAL THINKING**

   Assignments require the appropriate level of critical thinking

   For a given workorder identify the: frequency, task, description, procedure and location.

   List three advantages of a CMMS over a paper PM system.

   What information does a logging meter provide and how is it used?

   What might happen if you use water on a Class-B fire?

   What is the NEC and why is it important?

   Explain lockout-tagout and why it is used.

   List the appropriate PPE you might expect to see used in an MCC room.

   How does a grounded circuit protect a person from electrocution?

   Given a manufacturer catalog explain:
   What happens to FLC when motor 150341 is reconnected to 460VAC from 230VAC?
   Will the frame for model 750172 work on a frame mount designed for model 300112?

   What is the force on a flat head of a steam boiler drum (tube sheet) with a pressure of 100 psig and an area of 1,000 sq. in?

   What is the amount of work performed when lifting a 68 lb engine from the floor to the top of a 3’ high workbench?
What is the horsepower rating of an engine that produces 412,500 lb-ft of work in 2.5 minutes?

For a given schematic diagram:
What is the circuit resistance?
What is the power at load 1?
What is the voltage drop across load 2?

For a given line-diagram:
If M overloads open can the motor re-start if the float switch is closed?
When the timer times out which coil is energized?
What safety precautions should be taken when working on this circuit?

E. TEXTS AND OTHER READINGS (TYPICAL)


3. Other: Mechanical Trades Pocket Manual, Nelson

III. DESIRED LEARNING

A. COURSE GOAL

As a result of satisfactory completion of this course, the student should be prepared to:

understand and identify predictive and preventive maintenance requirements for industrial equipment.
Demonstrate understanding of industrial safety issues, equipment, regulations, and good practices.
Perform physical and mechanical calculations for energy and forces as they relate to service, repair principles, and electricity.

B. STUDENT LEARNING GOALS

Mastery of the following learning goals will enable the student to achieve the overall course goal.

1. Required Learning Goals

Upon satisfactory completion of this course, the student will be able to:

a. Apply the properties of matter to specific maintenance problems.

b. Perform calculations to determine horsepower, electrical, and temperature ratings.

c. Distinguish between maintenance requirements for mechanical, hydraulic, electrical, and pneumatic equipment.

d. Select the correct bearing for a prescribed application and define its lubrication needs.

e. Interpret a descriptive maintenance workorder for a that defines specific activities, materials, and times.

f. Categorize lubrication types and describe their appropriate applications.

g. Demonstrate understanding of Industrial Safety principles as they relate to maintaining equipment, PPE, NFPA, and fire safety.

IV. METHODS OF ASSESSMENT (TYPICAL)

A. FORMATIVE ASSESSMENT
1. Graded weekly written homework assignments requiring the student to demonstrate knowledge of selected topics and mastery of calculations.

2. Computer based tutorials that demonstrate and reinforce the fundamental principles of selected course topics.

B. **SUMMATIVE ASSESSMENT**

1. Computer based tutorials that demonstrate and reinforce fundamental principles of selected course topics.

2. Written examinations.