

GENERAL INFORMATION			
Name: Diane King	Phone #: 77021		
Course Prefix/Number: ETP2233	Course Title: Power Plant Components for Operations 1		
Number of Credits: 3			
Degree Type	<input type="checkbox"/> B.A. <input type="checkbox"/> B.S. <input type="checkbox"/> B.A.S <input type="checkbox"/> A.A. <input checked="" type="checkbox"/> A.S. <input type="checkbox"/> A.A.S. <input type="checkbox"/> C.C.C. <input type="checkbox"/> A.T.C. <input type="checkbox"/> V.C.C		
Date Submitted/Revised: 12-10-2010	Effective Year/Term: 2011-1		
<input checked="" type="checkbox"/> New Course Competency <input type="checkbox"/> Revised Course Competency			
Course to be designated as a General Education course (part of the 36 hours of A.A. Gen. Ed. coursework): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
The above course links to the following General Education Outcomes: <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Communication <input type="checkbox"/> Numbers / Data <input checked="" type="checkbox"/> Critical thinking <input type="checkbox"/> Information Literacy <input type="checkbox"/> Cultural / Global Perspective </td> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Social Responsibility <input type="checkbox"/> Ethical Issues <input checked="" type="checkbox"/> Computer / Technology Usage <input type="checkbox"/> Aesthetic / Creative Activities <input checked="" type="checkbox"/> Environmental Responsibility </td> </tr> </table>		<input checked="" type="checkbox"/> Communication <input type="checkbox"/> Numbers / Data <input checked="" type="checkbox"/> Critical thinking <input type="checkbox"/> Information Literacy <input type="checkbox"/> Cultural / Global Perspective	<input checked="" type="checkbox"/> Social Responsibility <input type="checkbox"/> Ethical Issues <input checked="" type="checkbox"/> Computer / Technology Usage <input type="checkbox"/> Aesthetic / Creative Activities <input checked="" type="checkbox"/> Environmental Responsibility
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Course Description (limit to 50 words or less): This course is designed for students who are preparing for careers in industrial and/or power plant operations. Students will learn to identify basic systems and components encountered in power plants and the principles, concepts, and applications associated with various power plant mechanical components. Prerequisite: ETP1230. Laboratory fee. A.S. degree credit only. (3 hr lecture).			
Prerequisite(s): ETP1230	Co requisite(s):		

Course Competencies:

Competency 1: The student will demonstrate an understanding of lubrication principles used in a power plant by:

1. Explaining lubrication principles associated with the following:
 - environmental hazards
 - factors that affect lubrication
 - friction and wear
 - fluid lubrication
 - lubricant types and characteristics
 - purpose and necessity
 - storage and transfer
 - symptoms and problems associated with improper lubrication
 - safety hazards
2. Demonstrating the safe handling, storage, and disposal of bulbs.
3. Describing and discussing the problems associated with improper lubrication.

Competency 2: The student will demonstrate an understanding of the purpose and use of valves and valve packing's by:

1. Identifying the types of valves and valve packing's, including: globe, gate, plug, vee ball, butterfly, check, relief and safety valves, and steam traps.
2. Describing common defects, indicators of wear, or malfunctions of valves and valve packing's.
3. Discussing the principles associated with steam traps and describing the following:

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- purpose
 - types (such as lever-operated, piston-operated and float-operated)
 - principles of operation
4. Explaining the principles associated with manual valves and describing the following:
 - types (gate, globe, butterfly, ball, check, needle, diaphragm-operated, plug, pressure relief, safety)
 - components (such as handle, stem, packing gland, valve disk, valve body, valve seat)
 - failure mechanisms and symptoms (such as thermal binding, leakage, difficulty in operating)
 - functions (isolation, throttling, relief, draining, venting)
 - operating characteristics (such as valve application)
 - position indication (such as local, remote, process parameters)
 5. Explaining the principles associated with valve operators and describing the following:
 - types (pneumatic, hydraulic, motor, solenoid)
 - principles of operation for motor-operated valves, air-operated valves and hydraulic-operated valves
 - failure mechanisms and symptoms (loss of power, air leaks, loss of hydraulics)
 - manual operation (such as override or failure)
 - alignment for remote control and/or automatic operation
 - testing
 - impact of environmental conditions
 6. Discussing the limitations of different valve types.

Competency 3: The student will demonstrate an understanding of the purpose and use of filters, strainers, steam traps, and screens by:

1. Identifying the types of filters, strainers, steam traps, and screens used in a power plant.
2. Explaining the principles and describing the components associated with strainers and filters, including:
 - purpose
 - types
 - operation
3. Explaining common defects, indicators of wear, or malfunctions of filters, strainers, steam traps, and screens.

Competency 4: The student will demonstrate an understanding of the purpose and use of air compressors by:

1. Identifying the types of compressors used in a power plant, such as rotary, reciprocating, centrifugal.
2. Explaining the principles associated with air compressors and describing the following:
 - classifications
 - components (such as staging, relief valve, cooling water)
 - principles of operation
 - failure mechanisms and symptoms (such as power loss, line ruptures, air pressure reduction, air operated component repositioning)
3. Explaining common defects, indicators of wear, and malfunctions of compressors.

Competency 5: The student will demonstrate an understanding of refrigeration, air conditioning, heating and ventilation systems in the power plant by:

1. Explaining the principles of operation of refrigeration machines and the basic refrigeration cycle.
2. Describing the purpose of air conditioning, heating and ventilation (HVAC) in the power plant.
3. Identifying the basic equipment used in the heating and ventilation systems -- including chiller units, heating units, fans, blowers, filters, ductwork, blowout ducts -- and their main structural components.
4. Describing the main structural components of refrigeration, heating, cooling, and ventilation systems in the power plant.
5. Discussing the principles of operation of heating, cooling, and ventilation systems in the power plant.
6. Explaining failure mechanisms and symptoms, such as loss of environmental control, loss of coolant charge, high- and low-pressure cutoffs, and gas binding of cooling system.
7. Discussing the types and functions of dampers used in heating and cooling systems.

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Competency 6: The student will demonstrate an understanding of the purpose and use of auxiliary components used in the power plant by:

1. Identifying:
 - the types of coupling and drive components used in a power plant
 - the types of bearings and bushings, including: roller, trust, and plain bearings
 - the types of seals, including mechanical and static
2. Explaining common defects, indicators of wear, or malfunctions of fans, coupling and drive components, bearings and bushings, and seals.
3. Describing the basic theory of operation and potential failure indications of the following:
 - frequency meter
 - ground detector
 - reed switches
 - potentiometer
 - limit switches
 - linear variable differential transformer

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