Course Outline

COURSE:  WTRM 235   DIVISION:  50  ALSO LISTED AS:

TERM EFFECTIVE:  Fall 2019   CURRICULUM APPROVAL DATE:  11/27/2018

SHORT TITLE: POLLUTION PREVENTION

LONG TITLE: Pollution Prevention

<table>
<thead>
<tr>
<th>Units</th>
<th>Number of Weeks</th>
<th>Contact Hours/Week</th>
<th>Total Contact Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>18</td>
<td>Lecture: 3</td>
<td>Lecture: 54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lab: 0</td>
<td>Lab: 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other: 0</td>
<td>Other: 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total: 3</td>
<td>Total: 54</td>
</tr>
</tbody>
</table>

COURSE DESCRIPTION:

Study of the raw materials and chemicals used in industry and the changes that occur as they move through the industrial process. Topics include: regulations, the materials balance concept of inventory, the importance of waste minimization/pollution prevention, and residential waste generation/reduction/prevention. This course has the option of a letter grade or pass/no pass.

PREREQUISITES:

COREQUISITES:

CREDIT STATUS: D - Credit - Degree Applicable

GRADING MODES

L - Standard Letter Grade
P - Pass/No Pass

REPEATABILITY: N - Course may not be repeated

SCHEDULE TYPES:

02 - Lecture and/or discussion
05 - Hybrid
72 - Dist. Ed Internet Delayed

STUDENT LEARNING OUTCOMES:

1. Define, describe and evaluate waste streams and hazardous materials generation, requirements and limitations, and reduction and minimization methods.
2. Compare and contrast local, state and federal pollution prevention laws including the agencies that regulate hazardous pollution and compliance.

Measure of assessment: written exam
Year assessed, or planned year of assessment: 2018
Semester: Fall

CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS
Curriculum Approval Date: 11/27/2018

6 Hours

Student Performance Objectives: Distinguish appropriate terms common to the pollution prevention industry. Name the types of chemicals used in Wood Furniture Manufacturing (WFM). Describe in detail the WFM process. List some of the major waste streams found in WFM. Name some of the pollution prevention options.

3 Hours

Student Performance Objectives: Describe and interpret the requirements of local, state and federal pollution prevention laws. Describe and model waste minimization and pollution prevention methods. Discuss the 8 step method to implementing a pollution prevention program. Describe pollution prevention requirements.

12 Hours

Student Performance Objectives: Describe the electroplating process and its pollution prevention options. Explain the recovery and recycling process. Name some of the commonly used technologies for reuse and recycling in the electroplating industry. State what a typical recovery and recycle system for the metal finishing process tank involves. Review the chemical industries pollution prevention performance. Discuss pollution prevention opportunities and how they might be implemented in the chemical industry. Discuss the history of solvents. Describe the typical hierarchy when investigating solvent substitution options. Discuss various water conservation techniques for these industries. Explain how facility planning factors into pollution prevention.

3 Hours

Student Performance Objectives: Define general manufacturing. Explain the importance of trade associations. List the sources of pollution prevention information. Discuss the life cycle design as it relates to general manufacturing.

4 Hours

Student Performance Objectives (SPO): Describe the history and the process. Discuss the Kraft Process as it relates to major waste streams, pollution prevention options and pollution prevention successes. List any local, state and federal regulations that govern the process.

6 Hours
Student Performance Objectives: Describe the industrial waste recycling process. List the local, state and federal regulations that govern this process. Discuss the waste minimization philosophy and its implementation. State the consumers role in the process.

6 Hours


Student Performance Objectives: Describe how biotechnology can effectively address issues pertaining to the monitoring, assessment, modeling and treatment of contaminated water, air and solid waste streams. Explain several different bio-techniques now available. List any local, state and federal regulations that govern the process.

3 Hours


Student Performance Objectives: Identify various pollution prevention methods for pesticides and fertilizers used in agriculture. List any local, state and federal regulations that govern their process. Investigate the conversion to sustainable agriculture.

3 Hours

Content: Source reduction programs - Overview of plans/programs. Developing plans/programs.

Student Performance Objectives: Define source reduction. Discuss the life cycle of a selected product. State the elements that would be a part of developing and implementing a pollution prevention plan/program.

3 Hours


Student Performance Objectives: List the types of companies that are considered consumer services industries. Provide an overview of each industry and state their typical waste streams. Explain several alternative pollution prevention options that they could utilize.

3 Hours


Student Performance Objectives: Describe the regulations that govern the safe disposal of hazardous waste. List the residentially used materials that are considered hazardous waste and therefore must be disposed of properly. Discuss ways that residents can minimize the use of hazardous waste materials.

2 Hours

METHODS OF INSTRUCTION:
lecture, discussion, multimedia presentations, field trips

OUT OF CLASS ASSIGNMENTS:
Required Outside Hours: 12
Assignment Description: Read appropriate textbook chapter, provided handout material and/or review notes from class presentations. Write a 1-2 page paper describing pollution prevention success stories.

Required Outside Hours: 6
Assignment Description: Read appropriate textbook chapter, provided handout material and/or review notes from class presentations. Prepare an overview of waste reduction techniques leading to pollution prevention. Begin work on your waste source reduction plan.

Required Outside Hours: 24
Assignment Description: Read appropriate textbook chapter, provided handout material and/or review notes from class presentations. Read the case study and complete the worksheet. Field Trip - visit an electronics based industry in the area to view their pollution prevention program and write a 2-3 page paper on their pollution prevention processes. Work on waste source reduction plan.

Required Outside Hours: 6
Assignment Description: Read appropriate textbook chapter, provided handout material and/or review notes from class presentations. Read the case study and complete the worksheet. Research at least 3 sources of pollution prevention information.
Required Outside Hours: 8
Assignment Description: Read appropriate textbook chapter, provided handout material and/or review notes from class presentations. Read the case study and complete the worksheet. Come prepared to discuss the Kraft Process in class. Work on your waste source reduction plan.

Required Outside Hours: 12
Assignment Description: Read appropriate textbook chapter, provided handout material and/or review notes from class presentations. Read the case study and complete the worksheet. Field Trip - visit an auto manufacturing plant in the bay area to view their industrial waste recycling process.

Required Outside Hours: 12
Assignment Description: Read appropriate textbook chapter, provided handout material and/or review notes from class presentations. Read the case study, complete the worksheet and come prepared to discuss with the class. Work on your waste source reduction plan.

Required Outside Hours: 12
Assignment Description: Read appropriate textbook chapter, provided handout material and/or review notes from class presentations. Read the case study, complete the worksheet and come prepared to discuss with the class.

Required Outside Hours: 6
Assignment Description: Read appropriate textbook chapter, provided handout material and/or review notes from class presentations.

Required Outside Hours: 6
Assignment Description: Read appropriate textbook chapter, provided handout material and/or review notes from class presentations. Complete your waste source reduction plan.

Required Outside Hours: 6
Assignment Description: Read appropriate textbook chapter, provided handout material and/or review notes from class presentations. Visit a local consumer services industry and come prepared to discuss with the class the type of pollution prevention methods they practice.

Required Outside Hours: 6
Assignment Description: Read appropriate textbook chapter, provided handout material and/or review notes from class presentations. List the various hazardous waste items that you as a resident use, how you dispose of them and how you might reduce their use.

METHODS OF EVALUATION:
Writing assignments
Percent of total grade: 20.00 %
Percent range of total grade: 20 % to 40 %
Written Homework Other: Develop a waste source reduction plan.

Problem-solving assignments
Percent of total grade: 20.00 %
Percent range of total grade: 20 % to 30 %
Other: Case studies.

Objective examinations
Percent of total grade: 40.00 %

REPRESENTATIVE TEXTBOOKS:
Required Representative Textbooks

Recommended Other Texts and Materials
Textbook option: Industrial Pollution Prevention Handbook by Harry M. Freeman
ARTICULATION and CERTIFICATE INFORMATION

Associate Degree:  
CSU GE:  
IGETC:  
CSU TRANSFER:  
    Not Transferable  
UC TRANSFER:  
    Not Transferable  

SUPPLEMENTAL DATA:  
Basic Skills: N  
Classification: Y  
Noncredit Category: Y  
Cooperative Education:  
Program Status: 1 Program Applicable  
Special Class Status: N  
CAN:  
CAN Sequence:  
CSU Crosswalk Course Department:  
CSU Crosswalk Course Number:  
Prior to College Level: Y  
Non Credit Enhanced Funding: N  
Funding Agency Code: Y  
In-Service: N  
Occupational Course: C  
Maximum Hours: 3  
Minimum Hours: 3  
Course Control Number: CCC000573910  
Sports/Physical Education Course: N  
Taxonomy of Program: 095800