

Course Outline

COURSE: WTRM 219 **DIVISION:** 50 **ALSO LISTED AS:** WTRM 119

TERM EFFECTIVE: Fall 2019 **CURRICULUM APPROVAL DATE:** 12/11/2018

SHORT TITLE: INDUSTRIAL WASTEWATER MGMT

LONG TITLE: Industrial Wastewater Management and Treatment

Units	Number of Weeks		Contact Hours/Week		Total Contact Hours
3	18	Lecture:	3	Lecture:	54
		Lab:	0	Lab:	0
		Other:	0	Other:	0
		Total:	3	Total:	54

COURSE DESCRIPTION:

Industrial Wastewater Management and Treatment reviews various industries and their associated wastewater. The course introduces the characteristics of wastewater such as pH, total suspended solids, total dissolved solids, etc., and then reviews basic treatment methods that are used to remove the particular characteristic from the water. By the end of the course, students will be able to design a wastewater treatment plant by developing block flow diagrams which utilize basic treatment methods to achieve the desired wastewater quality. This course was previously listed as WTRM 119. **ADVISORY:** WTRM 201: Introduction to Water/Wastewater Technology and WTRM 207: Beginning Wastewater Treatment Plant Operation.

PREREQUISITES:

COREQUISITES:

CREDIT STATUS: D - Credit - Degree Applicable

GRADING MODES

L - Standard Letter Grade

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. Outline the key aspects of industrial wastewater, industry sources, operations, and wastewater characteristics; including utilizing correct terminology.

Measure of assessment: Quizzes, Exams, Homework Assignments

Year assessed, or planned year of assessment: 2018

Semester: Spring

2. Describe wastewater treatment system design, water analysis, equipment selection, equipment sequencing.

Measure of assessment: Measure of assessment: Quizzes, Exams, Homework Assignments

Year assessed, or planned year of assessment: 2018

Semester: Spring

3. Apply mathematics including area and volume and conversion of units used in the Industrial Wastewater Management and Treatment Industry.

Measure of assessment: Quizzes, Exams, Problem Worksheets, Homework

Year assessed, or planned year of assessment: 2018

Semester: Spring

CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS

Curriculum Approval Date: 12/11/2018

9 Hours

Content: Review of sources and processes creating industrial wastewater.

Student Performance Objectives: Outline the major sources and industrial processes which create industrial wastewater.

9 Hours

Content: Basic water chemistry, acid neutralization, oxidation reduction and precipitation.

Student Performance Objectives: Explain the primary components of basic water chemistry which relate to industrial wastewater treatment, including acid neutralization, oxidation reduction and precipitation. Explain the important aspects of basic waste water chemistry.

21 Hours

Content: Computation of Area and Volume. Conversion of Units. Wastewater treatment unit operations, design and use.

Student Performance Objectives: Identify and apply the formulas needed to successfully solve word problems. Calculate area and volume and convert units. Describe the key factors required for effective wastewater treatment unit operations, design and use. Outline the current wastewater treatment methods and associated equipment.

13 Hours

Content: Wastewater treatment system design and configuration.

Student Performance Objectives: Outline the key approaches for wastewater treatment system design and configuration. Outline the key components of waste water treatment system design projects and student group system design.

2 Hours

METHODS OF INSTRUCTION:

Lecture, Discussion

OUT OF CLASS ASSIGNMENTS:

Required Outside Hours: 18

Assignment Description: Out-of-Class Assignments: Read material in textbook related to class presentations. Complete take home problems relating to the major sources and industrial processes which create industrial wastewater.

Required Outside Hours: 18

Assignment Description: Out-of-Class Assignments: Read material in textbook related to class presentations. Complete group homework related to the primary components of basic water chemistry which relate to industrial wastewater treatment, including acid neutralization, oxidation reduction and precipitation.

Required Outside Hours: 42

Assignment Description: Out-of-Class Assignments: Read material in textbook related to class presentations. Complete group project related to the key factors required for effective wastewater treatment unit operations, design and use. Complete math worksheet to successfully solve word problems.

Required Outside Hours: 26

Assignment Description: Out-of-Class Assignments: Read material in textbook related to class presentations. Complete take home problems relating to the key approaches for wastewater treatment system design and configuration.

METHODS OF EVALUATION:

Writing assignments

Percent of total grade: 30.00 %

Written Homework, Group Projects

Problem-solving assignments

Percent of total grade: 30.00 %

Homework Problems, Quizzes, Exams

Objective examinations

Percent of total grade: 40.00 %

Multiple Choice, Completion, Other: process design

REPRESENTATIVE TEXTBOOKS:

Daniel Flynn. The Nalco Water Handbook, 3rd Edition, or other appropriate college level text.. McGraw-Hill Professional,2009.

This is the most current edition of this handbook. There are not a lot of options available and this is the preferred one. The 2nd Edition was published in 1988 and the original one was published in 1979, so you can see that a lot of time passes between each edition. Perhaps by the time the course is taught, a new edition will be released.

ISBN: 978-0071548830

Reading Level of Text, Grade: 11th Verified by: Dana Young

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: CCC000530896

Sports/Physical Education Course: N

Taxonomy of Program: 095800