

Course Outline

COURSE: WTRM 109 **DIVISION:** 50 **ALSO LISTED AS:**

TERM EFFECTIVE: Fall 2018 **Inactive Course**

SHORT TITLE: ADVANCED W T PLANT OPERATION

LONG TITLE: Advanced Water Treatment Plant Operation

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:

This course focuses on advanced water quality control and treatment with emphasis on state regulations, EPA regulations, advanced mathematics and water chemistry. The course will include an in-depth study of treatment plant processes and their relation to current water quality regulations. This course will be helpful to those preparing for the CDPH Grade T3 and T4. This course is now listed as WTRM 209. **ADVISORY:** WTRM 102 Beginning Water/Wastewater Mathematics; WTRM 106 Beginning Water 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

STUDENT LEARNING OUTCOMES:

1. Solve advanced waterworks mathematics calculations.

Measure of assessment: Quizzes, Grade assignments

Year assessed, or planned year of assessment: Fall 2017

2. Identify the various sources of water in California, comparing the benefits and drawbacks.

Measure of assessment: Quiz, Exam

Year assessed, or planned year of assessment: Fall 2017

3. Evaluate various methods of disinfection as they relate to specific applications.

Measure of assessment: Quiz, Exam

Year assessed, or planned year of assessment: Fall 2017

4. Describe laboratory procedures as they relate to advanced water treatment.

Measure of assessment: Quiz, Exam

Year assessed, or planned year of assessment: Fall 2017

5. Assess and compare regulations relating to water quality.

Measure of assessment: Quiz, Exam

Year assessed, or planned year of assessment: Fall 2017

6. Define the procedures and components used in advanced water treatment.

Measure of assessment: Quiz, Exam

Year assessed, or planned year of assessment: Fall 2017

7. Analyze the hazards and safety procedures related to water treatment.

Measure of assessment: Quiz, Exam

Year assessed, or planned year of assessment: Fall 2017

8. Analyze and explain advanced water testing procedures.

Measure of assessment: Quiz, Exam

Year assessed, or planned year of assessment: Fall 2017

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

Inactive Course: 11/13/2017

6 Hours

Content: Water Works Math Review

Student Performance Objectives (SPO): Calculate dosage rates, area and volume, static head pressure, and unit and conversion factors.

Out-of-Class Assignments: Graded Take Home Math assignments

6 Hours

Content: Advance Water Treatment Math

Student Performance Objectives (SPO): Calculate energy usage, filtration efficiencies, blending rates and advanced dosages with different specific gravities.

Out-of-Class Assignments: Graded Take Home Math assignments

3 Hours

Content: Iron and Manganese Control

Student Performance Objectives (SPO): Discuss different techniques to treat iron and manganese, including phosphate treatment, oxidizing filter treatment, and eliminating plumbing corrosion.

Out-of-Class Assignments: Read Kerri Chapter 12 (in Vol 2 manual)

3 Hours

Content: Fluoridation

Student Performance Objectives (SPO): Explain the fluoridation process, including the issues surrounding fluoride in the water supply, as well as how fluoride is introduced and dosed using positive displacement pumps and a saturator.

Out-of-Class Assignments: Read Kerri Chapter 13

3 Hours

Content: Softening

Student Performance Objectives (SPO): Discuss the causes water hardening, the characteristics of calcium, manganese, and other ions in hard water, as well as techniques for removing these chemicals.

Out-of-Class Assignments: Read Kerri Chapter 14

3 Hours

Content: Specialized Treatment Processes

Student Performance Objectives (SPO): Explain the associated chemistry and treatment process impact on scaling and corrosion, as well as other specialized processes to handle unique situations.

Out-of-Class Assignments: Read Kerri Chapter 15

5 Hours

Content: Membrane Treatment Processes (Membrane Filtration and Demineralization)

Student Performance Objectives (SPO): Explain the nanofiltration, microfiltration and desalination processes used to treat water, including any post treatment process needed with this type of filtration.

Out-of-Class Assignments: Read Kerri Chapter 16 , Mid - Term Exam

3 Hours

Content: Handling and Disposal of Process Wastes

Student Performance Objectives (SPO): Outline the different waste categories and the proper disposal of wastes constantly dealt with in a water treatment environment , including mercury, arsenic, nitrates, manganese, iron and other waste by-products in the treatment process.

Out-of-Class Assignments: Read Kerri Chapter 17

3 Hours

Content: Maintenance

Student Performance Objectives (SPO): Identify common maintenance activities that need to be completed in the water treatment plant, and ways to track that maintenance.

Out-of-Class Assignments: Read Kerri Chapter 18

3 Hours

Content: Instrumentation and Control Systems

Student Performance Objectives (SPO): Explain how SCADA controls are read and how they work.

Out-of-Class Assignments: Read Kerri Chapter 19

3 Hours

Content: Advanced Laboratory Procedures

Student Performance Objectives (SPO): Discuss different specific laboratory procedures used to address water quality issues for different types of treatment environments.

Out-of-Class Assignments: Read Kerri Chapter 21

6 Hours

Content: Drinking Water Regulations

Student Performance Objectives (SPO): Outline specific EPA and California regulations addressing both the primary and secondary standards of treatment.

Out-of-Class Assignments: Read Kerri Chapter 22

5 Hours

Content: Administration

Student Performance Objectives (SPO): Describe how to effectively manage a water treatment plant from a business, political, strategic, and quality control perspective.

Out-of-Class Assignments: Read Kerri Chapter 23

2 Hours

METHODS OF INSTRUCTION:

Lecture presentation and instruction Video presentations Guest lecturer Review of current news articles Field trip to a water treatment facility Take-home word problem worksheets with sample problems to be graded and discussed in class.

METHODS OF EVALUATION:

Writing assignments

Percent of total grade: 0.00 %

Course primarily involves skill demonstration or problem solving

Problem-solving assignments

Percent of total grade: 40.00 %

Percent range of total grade: 40 % to 60 % Homework Problems Exams

Skill demonstrations

Percent of total grade: 0.00 %

Objective examinations

Percent of total grade: 40.00 %

Percent range of total grade: 40 % to 60 % Multiple Choice Other: Math - show work

Other methods of evaluation

Percent of total grade: 0.00 %

REPRESENTATIVE TEXTBOOKS:

Required Representative Textbooks

Kenneth D. Kerri. Water Treatment Plant Operation, Volume II, 6th Edition, or other appropriate college level text.. California State University, Sacramento: University Enterprises, Inc.,2015.

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

ARTICULATION and CERTIFICATE INFORMATION

Associate Degree:

CSU GE:

IGETC:

CSU TRANSFER:

Transferable CSU, effective 201230

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: WTRM
CSU Crosswalk Course Number: 109
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: CCC000529235
Sports/Physical Education Course: N
Taxonomy of Program: 095800