

**Course Outline**

**COURSE:** WTRM 106      **DIVISION:** 50      **ALSO LISTED AS:**

**TERM EFFECTIVE:** Spring 2018      **Inactive Course**

**SHORT TITLE:** BEGINNING W T PLANT OPS

**LONG TITLE:** Beginning 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 is a comprehensive course that teaches basic principles of operation and maintenance of water treatment plant. The course covers sources of water; public health aspects of water supply; physical and bacteriologic standards of water quality; types of water treatment plants, water treatment procedures, operation, storage and distribution. This course is designed to prepare the student to take the State of California Water Treatment Operator exam. (T1, T2) This course is now listed as WTRM 206. **ADVISORY:** WTRM 101 Introduction to Water/Wastewater Technology; WTRM 102 Beginning Water/Wastewater Mathematics.

**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 basic waterworks mathematics calculations.

Measure: Quizzes, Grade assignments

PLO:

ILO: 3,2,7

Year assessed, or planned year of assessment: Fall 2016

2. Identify various sources of water in California.

Measure: Quiz, Exam

PLO:

ILO: 3,2,7,6

Year assessed, or planned year of assessment: Fall 2016

3. Evaluate various methods of disinfection as it relates to specific cases.

Measure: Quiz, Exam

PLO:

ILO: 3,2,7,6

Year assessed, or planned year of assessment: Fall 2016

4. Assess and compare regulations relating to water quality.

Measure: Quiz, Exam

PLO:

ILO: 3,2,7,6

Year assessed, or planned year of assessment: Fall 2016

5. Analyze and explain basic water testing procedures.

Measure: Quiz, Exam

PLO:

ILO: 3,2,7,6

Year assessed, or planned year of assessment: Fall 2016

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

Measure: Quiz, Exam

PLO:

ILO: 3,2,7,6

Year assessed, or planned year of assessment: Fall 2016

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

Measure: Quiz, Exam

PLO:

ILO: 3,2,7,6

Year assessed, or planned year of assessment: Fall 2016

8. Compare types of reactions as applied to water treatment.

Measure: Quiz, Exam

PLO:

ILO: 3,2,7,6

Year assessed, or planned year of assessment: Fall 2016

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

Inactive Course: 11/13/2017

9 Hours

Content: Waterworks Mathematics

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

Out-of-Class Assignments: Take home worksheets to be graded.

3 Hours

Content: Sources of Water Supply

Student Performance Objectives (SPO): Explain ground water and surface water characteristics, the hydrological cycle, and well construction and location.

Out-of-Class Assignments: Read Kerri Chapter 1, 2

3 Hours

Content: Reservoir Management and Intake Structures

Student Performance Objectives (SPO): Discuss different types of intake devices and applications, and watershed issues involved with surface sources.

Out-of-Class Assignments: Read Kerri Chapter 3

3 Hours

Content: Coagulation and Flocculation

Student Performance Objectives (SPO): Describe the concepts and applications of coagulation and flocculation, Perform a jar test, select the proper coagulant and determine the dosage, adjust chemical feed rates, and select optimum speeds for flash mixers and flocculators.

Out-of-Class Assignments: Read Kerri Chapter 4

3 Hours

Content: Sedimentation

Student Performance Objectives (SPO): Identify factors affecting the performance of sedimentation basins and describe various types of sedimentation basins and how they work, start up and shut down sedimentation basins. Describe the components of effective recordkeeping for a sedimentation basin, as well as the safe performance of duties associated with a sedimentation basin.

Out-of-Class Assignments: Read Kerri Chapter 5

3 Hours

Content: Filtration

Student Performance Objectives (SPO): Describe the various types of potable water filters and how they work. Explain how other treatment processes affect the performance of the filtration process. Discuss how to operate and maintain filters under normal and abnormal process conditions, and start up and shut down filtration processes.

Out-of-Class Assignments: Read Kerri Chapter 6

6 Hours

Content: Disinfection

Student Performance Objectives (SPO): Describe different type of disinfectants, chlorine demand/residual, chlorination equipment, as well as chlorine safety and hazards.

Out-of-Class Assignments: Read Kerri Chapter 7 Mid term exam

3 Hours

Content: Corrosion Control

Student Performance Objectives (SPO): Outline the adverse effects of corrosion, describe how a pipe corrodes, select the proper chemical to control corrosion, describe cathodic protection to control corrosion, and troubleshoot to solve corrosion problems.

Out-of-Class Assignments: Read Kerri Chapter 8

3 Hours

Content: Taste and Odor Control

Student Performance Objectives (SPO): Explain the importance of taste and odor, identify causes of taste and odor, describe how to locate sources of taste and odor, and explain how to treat or eliminate undesirable taste and odor.

Out-of-Class Assignments: Read Kerri Chapter 9

3 Hours

Content: Plant Operation

Student Performance Objectives (SPO): Describe the responsibilities of plant operations, including regulation of flows, control of process, recordkeeping, maintenance of equipment, emergency procedures, and energy conservation.

Out-of-Class Assignments: Read Kerri Chapter 10

3 Hours

Content: Laboratory Procedures

Student Performance Objectives (SPO): Explain common lab practices, including jar testing, collecting lab samples, and testing for common water quality properties, such as alkalinity, chlorine residual, chlorine demand, coliform concentration, hardness, pH, temperature, and turbidity.

Out-of-Class Assignments: Read Kerry Chapter 11

3 Hours

Content: Water Quality

Student Performance Objectives (SPO): Describe the difference between physical properties of water, chemical properties of water, biological properties of water, and the effect of radioactivity on water.

Out-of-Class Assignments: Read Handout

3 Hours

Content: Regulations

Student Performance Objectives (SPO): Outline regulatory requirements including the Clean Water Act (CWA), Safe Drinking Water Act (SDWA), and Basic Water Rights.

Out-of-Class Assignments: Read Handout

4 Hours

Content: Safety

Student Performance Objectives (SPO): Explain plant safety techniques, chemical safety/MSDS, electrical safety, including ARC flash requirements, and confined space entry.

Out-of-Class Assignments: Read Handout

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 work problem work sheets with sample problems to be graded and discussed in class.

**METHODS OF EVALUATION:**

CATEGORY 1 - The types of writing assignments required:

Percent range of total grade: 0 % to %

If this is a degree applicable course, but substantial writing assignments are NOT appropriate, indicate reason:

Course primarily involves skill demonstration or problem solving

CATEGORY 2 - The problem-solving assignments required:

Percent range of total grade: 40 % to 60 %

Homework Problems

Exams

CATEGORY 3 - The types of skill demonstrations required:

Percent range of total grade: 0 % to 10 %

Field Work

CATEGORY 4 - The types of objective examinations used in the course:

Percent range of total grade: 40 % to 60 %

Multiple Choice

Other: Water Math - Show work

CATEGORY 5 - Any other methods of evaluation:

Participation

Percent range of total grade: 0 % to 20 %

**REPRESENTATIVE TEXTBOOKS:**

Required Representative Textbooks

Kenneth D. Kerri. Water Treatment Plant Operation Volume 1, 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: 106  
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: CCC000529232  
Sports/Physical Education Course: N  
Taxonomy of Program: 095800