

Course Outline

COURSE: WTRM 208 **DIVISION:** 50 **A LSO LISTED AS:** WTRM 108

TERM EFFECTIVE: Fall 2019 **CURRICULUM APPROVAL DATE:** 11/13/2018

SHORT TITLE: WATER DISTRIBUTION 2

LONG TITLE: Water Distribution 2

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:

Designed as the second part of an integrated sequence of two courses covering water distribution systems. Enables students to gain a more comprehensive understanding of the operation and maintenance of waterworks distribution systems, including advanced calculations, management, safety and emergency response issues. Contemporary issues facing the water and wastewater industry are also explored in depth. This course is part of a series required for eligibility to take the State certification examinations; supports certification examinations for CDPH grade levels D3, D4 and D5. This course was previously listed as WTRM 108. **ADVISORY:** WTRN 205 Water Distribution 1 and WTRM 202 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

05 - Hybrid

72 - Dist. Ed Internet Delayed

STUDENT LEARNING OUTCOMES:

1. Analyze the operation and maintenance of waterworks distribution systems.

Measure of assessment: Homework, Exam

Year assessed, or planned year of assessment: 2019

Semester: Spring

2. Solve advanced mathematical calculations and conversions.

Measure of assessment: Graded homework assignments.

Year assessed, or planned year of assessment: 2019

Semester: Spring

3. Illustrate the safety precautions and procedures related to water distribution.

Measure of assessment: Exam, Homework

Year assessed, or planned year of assessment: 2019

Semester: Spring

4. Demonstrate the ability to meet the written test standards for the State of California CDPH Grade Levels D3, D, and D5 certification exams.

Measure of assessment: Quizzes, Exams, Worksheets

Year assessed, or planned year of assessment: 2019

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

Curriculum Approval Date: 11/13/2018

3 Hours

Content: Overview of Course Objectives - Review of Distribution Concepts.

Student Performance Objectives: Discuss the principles of distribution construction.

15 Hours

Content: Distribution Advanced Mathematics including area, volume, flow, dosage, solutions, HP, KW power calculations, temperature, pressure gradients, "C" factor, and detention times.

Student Performance Objectives: Mathematically construct different water math problems applied directly to water distribution principles. Calculate system pressures at various points within a distribution system and other hydraulic measures.

5 Hours

Content: Distribution Components and Appurtenances including valves, hydrants, pipelines, air release valves, tanks, reservoirs and standpipes.

Student Performance Objectives: Discuss distribution components and appurtenances. Identify and discuss the components of a water distribution system. Classify the various types of meters used in water distribution and explain the advantages of each.

6 Hours

Content: Disinfection

Student Performance Objectives: Describe chlorination techniques and associated equipment, as well as chlorine regulation requirements. Define the level and type of disinfection necessary during maintenance and repairs of distribution facilities.

6 Hours

Content: Wells, Pumps, and Motors including types and designs, pump curves and specifications, and repair and maintenance.

Student Performance Objectives: Discuss pumps and the relevant water distribution issues, including cost and operation. Describe the parts and operation of a water well, pumps and motors.

3 Hours

Content: Safety - confined space entry, trench safety, MSDS, traffic control, OSHA regulations, and lock out/tagout procedures.

Student Performance Objectives: Discuss and design traffic controls, trench shoring, and related safety regulations in a construction and operations environment.

6 Hours

Content: Water Quality including examination of water regulations applicable to a Water Distribution System.
Student Performance Objectives: Outline the physical, chemical, biological and radioactive influences on water. Describe water quality requirements and regulations as they apply to water distribution.

3 Hours

Content: Distribution System Hydraulics including backflow devices, water hammer, cavitation issues, and surge tanks.

Student Performance Objectives: Describe the different forms of backflow prevention and explain the need for backflow prevention.

3 Hours

Content: Administration including management issues, record-keeping, and reporting requirements.

Student Performance Objectives: Explain the types of records, legal reporting requirements for a public agency vs. an investor owned utility. Explain the appropriate administrative applications and record-keeping requirements.

2 Hours

METHODS OF INSTRUCTION:

Lecture, discussion, multi-media.

OUT OF CLASS ASSIGNMENTS:

Required Outside Hours: 54

Assignment Description: Read appropriate textbook chapters and review study guide questions. Study for quizzes and exams.

Required Outside Hours: 54

Assignment Description: Written Homework/Problem Solving; Math Problems

METHODS OF EVALUATION:

Writing assignments

Percent of total grade: 25.00 %

Percent range of total grade: 20 % to 40 % Written Homework

Problem-solving assignments

Percent of total grade: 25.00 %

Percent range of total grade: 10% to 30% Math Problems, Quizzes

Objective examinations

Percent of total grade: 50.00 %

REPRESENTATIVE TEXTBOOKS:

Required Representative Textbooks

Kenneth D. Kerri. Water Distribution System Operation and Maintenance 6th Edition, or other appropriate college level text.. California State University, Sacramento: University Enterprises, Inc.,2012.

This is the most current edition of this textbook and the same one that is used at CSU Sacramento.

ISBN: 978-1-59371-061-3

Reading Level of Text, Grade: 12th 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: CCC000588728

Sports/Physical Education Course: N

Taxonomy of Program: 095800