

**Course Outline**

**COURSE:** WTRM 105      **DIVISION:** 50      **ALSO LISTED AS:**

**TERM EFFECTIVE:** Fall 2018      **Inactive Course**

**SHORT TITLE:** WATER DISTRIBUTION 1

**LONG TITLE:** Water Distribution 1

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 a water distribution system. It course covers the sources of water; principles of design; installation, operation and maintenance of pipes, pumps, valves, meters, and other regulated hydraulic units. Operation and maintenance safety considerations are emphasized. This course is designed to prepare the student to take the State of California Water Distribution Operator exam. This course is now listed as WTRM 205. **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. Describe proper waterworks technology

Measure: Exam

PLO:

ILO: 3.7

Year assessed, or planned year of assessment: Fall 2015

2. Identify the primary functions and responsibilities of water distribution operators

Measure: Exam

ILO:

ILO: 2.6

Year assessed, or planned year of assessment: Fall 2015

3. Identify the sources of water available and their uses.

Measure: Exam

PLO:

ILO: 3,7

Year assessed, or planned year of assessment: Fall 2015

4. Describe the various types of storage facilities and operational use of each.

Measure: Exam

PLO:

ILO: 3,7

Year assessed, or planned year of assessment: Fall 2015

5. Identify the fundamentals of water distribution systems, and the hydraulic characteristics of the different types.

Measure: Exam

PLO:

ILO: 3,7

Year assessed, or planned year of assessment: Fall 2015

6. Solve basic mathematical calculations and conversions such as volume, water flow, pressure, and chemical dosage.

Measure: Take-home graded assignments, Exams

PLO:

ILO: 2,3

Year assessed, or planned year of assessment: Fall 2015

7. Compare types of pipes used and corresponding water quality issues.

Measure: Exam

PLO:

ILO: 3,7

Year assessed, or planned year of assessment: Fall 2015

8. Diagram a typical water distribution system layout.

Measure: Assignment and short explanation paper, Exams

PLO:

ILO: 2,7

Year assessed, or planned year of assessment: Fall 2015

9. Evaluate the impact of various water valves used in a distribution system.

Measure: Exam

PLO:

ILO: 3,7

Year assessed, or planned year of assessment: Fall 2015

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

Inactive Course: 11/13/2017

3 Hours

Content: Distribution System Operations and Maintenance

Student Performance Objectives (SPO): Outline an overview of the water distribution occupation

Out-of-Class Assignments: Essay, library research

3 Hours

Content: Distribution System and Design

Student Performance Objectives (SPO): Outline the specifics of a water distribution systems plan

Out-of-Class Assignments: Take home design assignment

3 Hours

Content: Water Main pipe

Student Performance Objectives (SPO): Describe and compare different pipe characteristics

Out-of-Class Assignments: Reading, essay

3 Hours

Content: Distribution system valves

Student Performance Objectives (SPO): Describe and compare different types of valves in a water distribution system environment

Out-of-Class Assignments: Reading, essay

3 Hours

Content: Water Main installation

Student Performance Objectives (SPO): Outline the challenges and procedures for installing water main pipe

Out-of-Class Assignments: Reading, essay

3 Hours

Content: Backfilling and Main testing

Student Performance Objectives (SPO): Outline the critical aspects involved with installing a water main.

Out-of-Class Assignments: Quiz, reading

3 Hours

Content: Water Storage

Student Performance Objectives (SPO): Outline the different types of tanks and reservoirs used in a water distribution system

Out-of-Class Assignments: Essay, reading

3 Hours

Content: Water Services, meters, and hydrants

Student Performance Objectives (SPO): Describe water services and other elements used in a water distribution system.

Out-of-Class Assignments: Semi-final exam, reading, essay

3 Hours

Content: Distribution Math -Conversions

Student Performance Objectives (SPO): Demonstrate the ability to calculate and convert various water measurements

Out-of-Class Assignments: Homework problems, reading

3 Hours

Content: Distribution Math - Area and Volume

Student Performance Objectives (SPO): Calculate areas and volumes commonly found in water industry environments.

Out-of-Class Assignments: Homework problems, reading

3 Hours

Content: Distribution Math - Pressures and Flows

Student Performance Objectives (SPO): Calculate pressure and flow, as used in a water distribution system.

Out-of-Class Assignments: Homework problems

3 Hours

Content: Distribution Math - Intro to Dosage, Temperature

Student Performance Objectives (SPO): Describe and demonstrate an understanding of chlorine dosage and temperature calculation.

Out-of-Class Assignments: Homework problems

3 Hours

Content: Distribution System hydraulics

Student Performance Objectives (SPO): Outline the key simple hydraulic principles used in a distribution system design.

Out-of-Class Assignments: Essay, reading

3 Hours

Content: Traffic Control

Student Performance Objectives (SPO): Outline traffic control requirements and associated safety issues.

Out-of-Class Assignments: Essay, reading

3 Hours

Content: Cross Connection, Security, emergency preparedness, and response

Student Performance Objectives (SPO): Describe operational problems involved with running a water distribution system

Out-of-Class Assignments: Essay, reading

3 Hours

Content: Public Relations, Administration, customer service

Student Performance Objectives (SPO): Prepare an overview of administrative issues related to operating a water distribution system

Out-of-Class Assignments: Essay, reading

2 Hours

Final

**METHODS OF INSTRUCTION:**

Lecture and discussion

Visual Aids

Demonstrations

Facilities Tours (as available)

Class Participation

Quizzes

In class work sheets

Exams

Homework

**METHODS OF EVALUATION:**

CATEGORY 1 - The types of writing assignments required:

Percent range of total grade: 10 % to 20 %

Written Homework

Other: Design project

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: 30 % to 50 %

Homework Problems

Quizzes

CATEGORY 3 - The types of skill demonstrations required:

Percent range of total grade: 10 % to 20 %

Class Performance/s

Performance Exams

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

Percent range of total grade: 40 % to 60 %

Multiple Choice

Other: Math problems - Show work

**REPRESENTATIVE TEXTBOOKS:**

Required Representative Textbooks

William C. Lauer, Editor. Water Distribution Operator Training Handbook, 4th Edition, or other appropriate college level text. . American Water Works Association,2013.

NOTE: This is a standard text used in the water industry.

ISBN: 1583219544

Reading Level of Text, Grade: 10th 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: 105  
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: CCC000528477  
Sports/Physical Education Course: N  
Taxonomy of Program: 095800