GAVILAN COLLEGE
5055 Santa Teresa Blvd
Gilroy, CA 95023

Course Outline

COURSE: WTRM 205 DIVISION: 50 ALSO LISTED AS: WTRM 105

TERM EFFECTIVE: Summer 2025 CURRICULUM APPROVAL DATE: 03/11/2025

SHORT TITLE: WATER DISTRIBUTION 1

LONG TITLE: Water Distribution 1

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

Out of Class Hrs:	108.00
Total Learning Hrs:	162.00

COURSE DESCRIPTION:

This is a comprehensive course that teaches basic principles of operation and maintenance of a water distribution system. It 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 was previously listed as WTRM 105. ADVISORY: WTRM 201 Introduction to Water-Wastewater Technology and WTRM 202 Beginning Water-Wastewater Mathematics.

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
71 - Dist. Ed Internet Simultaneous
72 - Dist. Ed Internet Delayed

STUDENT LEARNING OUTCOMES:

By the end of this course, a student should:

1. Identify the fundamentals of water distribution systems from sources of supply to system layout, including hydraulic characteristics.

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

3. Demonstrate the ability to meet the written test standards for the State of California Water Distribution Operator exam.

COURSE OBJECTIVES:

By the end of this course, a student should:

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

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

3. Describe and compare different pipe characteristics. Compare types of pipes used and corresponding water quality issues.

4. Describe and compare different types of valves in a water distribution system environment. Evaluate the impact of various water valves used in a distribution

system.

5. Identify the challenges and procedures for installing water main pipes and mains.

6. Identify the different types of tanks and reservoirs used in a water distribution system and describe the various types of storage facilities and operational use of

each.

7. Calculate and convert various water measurements.

8. Calculate areas and volumes commonly found in water industry environments.

9. Calculate pressure and flow, as used in a water distribution system.

10. Describe and demonstrate chlorine dosage and temperature calculations.

11. Outline the key simple hydraulic principles used in a distribution system design.

12. Outline traffic control requirements and associated safety issues.

13. Describe operational problems involved with running a water distribution system.

14. Prepare an overview of administrative issues related to operating a water distribution system.

COURSE CONTENT:

Curriculum Approval Date: 03/11/2025

3 Hours

Content: Distribution System Operations and Maintenance

Student Performance Objectives: Outline an overview of the water distribution occupation. Identify the primary functions and responsibilities of water distribution operators.

3 Hours

Content: Distribution System and Design

Student Performance Objectives: Outline the specifics of a water distribution systems plan. Describe proper waterworks technology. Diagram a typical water distribution system layout. Identify the sources of water available and their uses.

3 Hours

Content: Water Main Pipe

Student Performance Objectives: Describe and compare different pipe characteristics. Compare types of pipes used and corresponding water quality issues.

3 Hours

Content: Distribution System Valves

Student Performance Objectives: Describe and compare different types of valves in a water distribution system environment. Evaluate the impact of various water valves used in a distribution system.

3 Hours

Content: Water Main Installation

Student Performance Objectives: Outline the challenges and procedures for installing water main pipe.

3 Hours

Content: Backfilling and Main Testing

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

3 Hours

Content: Water Storage

Student Performance Objectives: Outline the different types of tanks and reservoirs used in a water distribution system. Describe the various types of storage facilities and operational use of each.

3 Hours

Content: Water Services, Meters, and Hydrants. Midterm.

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

3 Hours

Content: Distribution Math - Conversions

Student Performance Objectives: Demonstrate the ability to calculate and convert various water measurements.

4 Hours

Content: Distribution Math - Area and Volume

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

4 Hours

Content: Distribution Math - Pressures and Flows

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

4 Hours

Content: Distribution Math - Introduction to Dosage, Temperature

Student Performance Objectives: Describe and demonstrate chlorine dosage and temperature calculations.

COURSE CONTENT(CONTINUED):

4 Hours

Content: Distribution System Hydraulics

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

3 Hours

Content: Traffic Control

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

3 Hours

Content: Cross Connection, Security, Emergency Preparedness and Response

Student Performance Objectives: Describe operational problems involved with running a water distribution system.

3 Hours

Content: Public Relations, Administration, Customer Service

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

2 Hours

Final Exam.

METHODS OF INSTRUCTION:

Lectures, discussions, Video Presentations, Quizzes, Assignments

OUT OF CLASS ASSIGNMENTS:

Required Outside Hours 36

Assignment Description

Read textbook and study for quizzes (Periodic short objective tests of course-related concepts, such as mathematical theory, procedures or techniques applied water distribution.) and midterm and final exams (A combination of objective questions on important concepts and mathematical problems.).Read related textbook chapters and/or modules. Study for exams.

Required Outside Hours 36

Assignment Description

Assignment Description: Homework (such as): Take - math assignments. Discussions and presentation demonstrating the student's understanding of an article taken from a trade journal that addresses a distribution related topic that exemplifies current discussions or theories.

Required Outside Hours 36

Assignment Description

Identify and problem solving for math concepts for distribution by performing assignments, discussions and quizzes

METHODS OF EVALUATION:

Writing assignments
Evaluation Percent 10
Evaluation Description
Percent range of total grade: 10% to 20%
Assignments and Discussions
Other: Design project

Problem-solving assignments
Evaluation Percent 30
Evaluation Description
Percent range of total grade: 30% to 50%
Assignments, Discussions
Quizzes

Skill demonstrations
Evaluation Percent 10
Evaluation Description
Percent range of total grade: 0% to 20%
Discussions

Objective examinations
Evaluation Percent 50
Evaluation Description
Percent range of total grade: 40% to 60%
Multiple Choice, True and False
Other: Math problems - Show work

REPRESENTATIVE TEXTBOOKS:

Water Distribution Operator Training Handbook, or other appropriate college level text. , William C. Lauer, Editor, American Water Works Association, 2016 or a comparable textbook/material.

Rationale: NOTE:This text is an important industry standard text and is the most current edition available. This exact textbook is currently being used in the Certificate Water Program courses at CSU, Sacramento.

10th Grade Verified by: Dana Young

ARTICULATION and CERTIFICATE INFORMATION

Associate Degree:
CSU GE:
IGETC:
CSU TRANSFER:
Not Transferable
Not Transferable
UC TRANSFER:
Not Transferable
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:
Minimum Hours:
Course Control Number: CCC000588727
Sports/Physical Education Course: N
Taxonomy of Program: 095800