



5055 Santa Teresa Blvd  
Gilroy, CA 95023

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### Course Outline

**COURSE:** WTRM 217      **DIVISION:** 50      **ALSO LISTED AS:** WTRM 117

**TERM EFFECTIVE:** Summer 2024

**CURRICULUM APPROVAL DATE:** 06/11/2024

**SHORT TITLE:** WATER USE EFFICIENCY PRACT

**LONG TITLE:** Water Use Efficiency Practitioner

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

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Out of Class Hrs:      108.00

Total Learning Hrs:      162.00

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#### **COURSE DESCRIPTION:**

This course focuses upon the efficient use and conversation of water in the following contexts: overall supply and demand; utility operations and measures; residential uses and measures; commercial, institutional uses and measures; and landscape uses and measures. This course was previously listed as WTRM 117.

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

## STUDENT LEARNING OUTCOMES:

By the end of this course, a student should:

1. Explain the major elements of water use and conservation as it pertains to residential, commercial, industrial, institutional, and agricultural uses.
2. Discuss the primary aspects of water supply and demand, including supplier and regulator roles, supply sources, and overall urban demand

## COURSE OBJECTIVES:

By the end of this course, a student should:

1. Review the key aspects of water supply and demand as they apply to water suppliers and regulators, water rights, and both groundwater and surface water supplies.
2. Discuss the key aspects of water supply and demand as they apply to urban demand.
3. Discuss key facets of water supply and demand as they apply to agricultural demand and the role of water conservation.
4. Review the key aspects of water supply and demand as they apply to urban water management plans, water shortage contingency plans, and major water systems.
5. Review the key factors of utility water demand, its associated measures, demand characteristics, operations, and related performance measures.
6. Review the key characteristics of customer demand.
7. Discuss the primary water conservation measures which can be implemented by a water utility.
8. Discuss the key elements of customer billing, cycles, and rate structures as they relate to utility water demand.
9. Discuss the key aspects of indoor residential water usage, including fixtures, appliances, toilets, and conservation measures.
10. Discuss the key aspects of indoor residential water usage, including fixtures, appliances, toilets, and conservation measures.
11. Discuss the primary components of outdoor water conservation measures and water usage survey techniques.
12. Discuss the key aspects of indoor commercial, industrial, and institutional water usage and conservation measures.
13. Discuss the primary components of outdoor commercial, industrial, and institutional water usage and conservation measures.
14. Discuss the key aspects of water usage in the outdoor landscape, including irrigation systems, plant material choice, and soil improvement.
15. Discuss the importance of turfgrass types, horticultural practices, and artificial grass alternatives as they relate to water conservation in the outdoor landscape.
16. Explain the relevance of non-potable water types and the application of water usage survey techniques in the outdoor landscape.

## **COURSE CONTENT:**

Curriculum Approval Date: 06/11/2024

3 Hours

Content: Water Supply and Demand; water supplier and regulator roles and responsibilities; water rights, groundwater supplies, surface water supplies and other supplies of water (e.g., recycled water, desalination, and groundwater recharge).

3 Hours

Content: Urban demand Memorandum of Understanding and best management practices for single and multifamily residential, Commercial, Industrial, Institutional and Irrigation.

3 Hours

Content: Agricultural Demand and Memorandum of Understanding and best management practices, role of water conservation and long-term versus short-term conservation programs

3 Hours

Content: Urban water management plans, water shortage contingency plans and major water systems (e.g., Bay Delta, Colorado River and Truckee River)

3 Hours

Content: Utility water demand characteristics, operations, and measures, including common units of measurement, such as gallons per capita per day.

3 Hours

Content: Customer demand characteristics, user classification and demand hardening.

3 Hours

Content: Utility Water demand characteristics, operations, and measures, such as, water pressure, impacts on demand, public health issues, water loss control, system audits, leak detection, water metering and water waste ordinance.

3 Hours

Content: Water Conservation fixture standards regulation, which includes concepts from California, Nevada and US plumbing standards, U.S. Energy Policy Act of 1992, and WaterSense, green building and LEED standards

3 Hours

Content: Residential uses and measures, include indoor end-uses of fixtures / appliances that use water conservation measures. Using conventional, water saving and high efficiency fixture and water appliances, such as low toilet flow, shower and faucet, standard low flow rates, high efficient clothes water and dishwasher usage.

3 Hours

Content: Outdoor water conservation measures, such as water features, outdoor cleaning, water-efficient irrigation, native landscaping, water use survey techniques, recommendations and incentives. Discussion of key factors associated with water usage and conservation in the outdoor landscape, including water-efficient landscaping principles, water usage survey, turf-grass, and non-potable water sources.

6 Hours

Content: Commercial, industrial and institutional uses and measures of indoor end-uses of fixtures / appliances, conventional water saving and high efficiency fixture / appliance water usage. Discussion of leak detection, field tests and measurements and water processes from cooling towers to treatment/water purification.

4 Hours

Content: Commercial, industrial and institutional uses and measures, from outdoor water conservation measures such as water features, outdoor cleaning strategies, water-efficient irrigation and landscape designing. Demonstration of water use survey techniques, recommendation and incentives.

3 Hours

Content: Landscape Uses and Outdoor Measures, with a discussion of soil, water and plant relationships, water efficient landscaping principles of hydrozones, irrigation systems, appropriate plant materials, evapotranspiration, and soil improvement like mulching.

**COURSE CONTENT (CONTINUED):**

3 Hours

Content: Landscape Uses and Outdoor Measures, like water use survey, water budget, irrigation controller and efficiency.

3 Hours

Content: Landscape Uses and Outdoor Measures: like turfgrass Alternatives to pacers and other outdoor groundcover measures for water conservation.

3 Hours

Content: Use of: Non-potable water, recycled water, graywater and rain capture.

2 Hours

Final Exam.

**METHODS OF INSTRUCTION:**

Lectures and Discussions, Multimedia, Visual Aids, Demonstrations.

**OUT OF CLASS ASSIGNMENTS**

Required Outside Hours 56

Assignment Description

Out-of-Class Assignments: Reading assignment in text. Study for quizzes and exams.

Required Outside Hours 18

Assignment Description

Complete homework problems related to utility water demand and its associated measures.

Required Outside Hours 34

Assignment Description

Report/Presentation on the key aspects of water supply and demand as they apply to urban or agricultural demand and the role of water conservation.

**METHODS OF EVALUATION:**

Problem-solving assignments

Evaluation Percent 20

Evaluation Description

10% - 20% Assignments, Discussions

Writing assignments

Evaluation Percent 30

Evaluation Description

30% - 40% Assignments, Discussions

Objective examinations

Evaluation Percent 50

Evaluation Description

40% - 50% Multiple Choice, True/False, Matching Items

**REPRESENTATIVE TEXTBOOKS:**

Handbook of Water Use and Conservation, or other appropriate college level text., Amy Vickers, WaterPlow Press, 2017 or a comparable textbook/material.

ISBN:

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

11th 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: CCC000530894

Sports/Physical Education Course: N

Taxonomy of Program: 095800