

Course Outline

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

TERM EFFECTIVE: Spring 2018 **Inactive Course**

SHORT TITLE: WATER USE EFFICIENCY PRACT

LONG TITLE: Water Use Efficiency Practitioner

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 course focuses upon the efficient use and conservation 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 is now listed as WTRM 217.

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. Discuss the primary aspects of water supply and demand, including supplier and regulator roles, supply sources, and overall urban demand.

Measure: Exams, homework assignments

PLO:

ILO: 7, 3, 2, 6

2. Outline the key components of utility water demand characteristics, operations, and related performance measures.

Measure: Exams, homework assignments

PLO:

ILO: 7, 3, 2, 6

3. Explain the major elements of indoor and outdoor residential water usage and conservation.

Measure: Exams, homework assignments

PLO:

ILO: 7, 3, 2, 6

4. List the major elements of commercial, industrial, and institutional indoor and outdoor water usage and conservation.

Measure: Exams, homework assignments

PLO:

ILO: 7, 3, 2, 6

5. Describe the 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.

Measure: Exams, homework assignments

PLO:

ILO: 7, 3, 2, 6

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

Inactive Course: 03/13/2017

3 Hours

I. Water Supply and Demand:

- a. Water supplier and regulator roles and responsibilities
- b. Water rights
- c. Groundwater supplies
- d. Surface water supplies
- e. Other supplies of water (e.g., recycled water, desalination, groundwater recharge, and transfers)

Student Performance Objectives (SPO): Outline 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.

Out-of-Class Assignments: Reading assignment in text

3 Hours

I. Water Supply and Demand:

- f. Urban demand Memorandum of Understanding and best management practices
 - i. Single and multi-family residential
 - ii. Commercial
 - iii. Industrial
 - iv. Institutional
 - v. Irrigation

Student Performance Objectives (SPO): Explain the key aspects of water supply and demand as they apply to urban demand.

Out-of-Class Assignments: Reading assignment in text

3 Hours

I. Water Supply and Demand, including:

- g. Agricultural demand and Memorandum of Understanding and best management practices
- h. Role of water conservation
- i. Long-term versus short-term conservation programs

Student Performance Objectives (SPO): Describe the key facets of water supply and demand as they apply to agricultural demand and the role of water conservation.

Out-of-Class Assignments: Reading assignment in text

3 Hours

I. Water Supply and Demand, including:

- i. Urban water management plans
- ii. Water shortage contingency plans
- j. Major water systems (e.g., Bay Delta, Colorado River and Truckee River)

Student Performance Objectives (SPO): Explain the key aspects of water supply and demand as they apply to urban water management plans, water shortage contingency plans, and major water systems.

Out-of-Class Assignments: Reading assignment in text

3 Hours

II. Utility Water demand characteristics, operations, and measures:

- a. Common units of measurement
 - i. Gallons per capita per day
 - ii. Customer billing units
 - iii. Acre feet
 - iv. Million gallons
 - v. Cubic feet per second

Student Performance Objectives (SPO): Explain the key factors of utility water demand and its associated measures.

Out-of-Class Assignments: Reading assignment in text

3 Hours

II. Utility Water demand characteristics, operations, and measures:

- b. Customer demand characteristics
 - i. User classification
 - ii. Demand hardening

Student Performance Objectives (SPO): Outline the key characteristics of customer demand.

Out-of-Class Assignments: Reading assignment in text

3 Hours

II. Utility Water demand characteristics, operations, and measures:

- c. Utility conservation measures
 - i. System water pressure
 - 1. Impacts on demand

2. Public health issue

ii. Water loss control

1. System audits

2. Leak detection

3. Non-revenue water

iii. Water meters

1. Types

2. Functions

3. Accuracy

4. Leak detection

iv. Water waste ordinance

Student Performance Objectives (SPO): Outline the primary water conservation measures which can be implemented by a water utility.

Out-of-Class Assignments: Reading assignment in text

3 Hours

II. Utility Water demand characteristics, operations, and measures:

d. Customer billing, cycles and rate structures

e. Conservation fixture standards

i. California, Nevada and US plumbing standards

ii. U.S. Energy Policy Act of 1992

iii. WaterSense, green building and LEED standards

Student Performance Objectives (SPO): Describe the key elements of customer billing, cycles, and rate structures as they relate to utility water demand.

Out-of-Class Assignments: Reading assignment in text

3 Hours

III. Residential uses and measures:

a. Indoor end-uses of fixtures and appliances

b. Conventional, water saving and high efficiency fixture and appliance water usage

c. Leak detection, field tests and measurements

d. Indoor water conservation measures

i. Toilets

ii. Shower and faucet standard flow rates

iii. Clothes washer water usage

iv. Dishwasher water usage

Student Performance Objectives (SPO): Explain the key aspects of indoor residential water usage, including fixtures, appliances, toilets, and conservation measures.

Out-of-Class Assignments: Reading assignment in text

3 Hours

III. Residential uses and measures:

e. Outdoor water conservation measures

i. Pool-Spa and water features

ii. Outdoor cleaning

iii. Water-efficient irrigation and landscape

f. Water use survey techniques, recommendations and incentives

Student Performance Objectives (SPO): Describe the primary components of outdoor water conservation measures and water usage survey techniques.

Out-of-Class Assignments: Reading assignment in text

6 Hours

IV. Commercial, industrial and institutional uses and measures:

- a. Indoor end-uses of fixtures and appliances
- b. Conventional water saving and high efficiency fixture and appliance water usage
- c. Leak detection, field tests and measurements
- d. Indoor water conservation measures
 - i. Toilets
 - ii. Shower and faucet standard flow rates
 - iii. Clothes washer water usage
 - iv. Dishwasher water usage
 - v. Treatment/water purification
 - vi. Cooling towers
 - vii. Process water

Student Performance Objectives (SPO): Explain the key aspects of indoor commercial, industrial, and institutional water usage and conservation measures.

Out-of-Class Assignments: Reading assignment in text

6 Hours

IV. Commercial, industrial and institutional uses and measures:

- e. Outdoor water conservation measures
 - i. Pool-Spa and water features
 - ii. Outdoor cleaning
 - iii. Water-efficient irrigation and landscape
- f. Water use survey techniques, recommendation and incentives

Student Performance Objectives (SPO): Discuss the primary components of outdoor commercial, industrial, and institutional water usage and conservation measures.

Out-of-Class Assignments: Reading assignment in text

3 Hours

V. Landscape Uses and Outdoor Measures:

- a. Soil, water and plant relationships
- b. Water efficient landscaping principles
 - i. Hydrozones
 - ii. Irrigation systems
 - iii. Appropriate plant materials
- iv. Evapotranspiration and CIMIS
- v. Weather-based irrigation controller
- vi. Soil improvement and mulching

Student Performance Objectives (SPO): Outline the key aspects of water usage in the outdoor landscape, including irrigation systems, plant material choice, and soil improvement.

Out-of-Class Assignments: Reading assignment in text

3 Hours

V. Landscape Uses and Outdoor Measures:

- c. Water use survey
- i. Water budget
- ii. Irrigation controllers
- iii. Irrigation efficiency
- iv. Area measurement

Student Performance Objectives (SPO): Explain the key components of an outdoor landscape water usage survey.

Out-of-Class Assignments: Reading assignment in text

3 Hours

V. Landscape Uses and Outdoor Measures:

- d. Turfgrass
 - i. Types
 - ii. Horticultural practices
 - iii. Alternatives to turfgrass
- e. Other outdoor water conservation measures

Student Performance Objectives (SPO): Describe the importance of turfgrass types, horticultural practices, and turfgrass alternatives as they relate to water conservation in the outdoor landscape.

Out-of-Class Assignments: Reading assignment in text

3 Hours

V. Landscape Uses and Outdoor Measures:

- f. Non-potable water
 - i. Recycled
 - ii. Graywater
 - iii. Rain capture
- g. Water use survey techniques, recommendations and incentives

Student Performance Objectives (SPO): Explain the relevance of non-potable water types and the application of water usage survey techniques in the outdoor landscape.

Out-of-Class Assignments: Reading assignment in text

2 Hours

Final

METHODS OF INSTRUCTION:

Lecture, discussion, reading assignments, reports, presentations, quizzes, and exams

METHODS OF EVALUATION:

CATEGORY 1 - The types of writing assignments required:

Percent range of total grade: 10 % to 15 %

Written Homework

CATEGORY 2 - The problem-solving assignments required:

Percent range of total grade: 20 % to 25 %

Homework Problems

Quizzes

Exams

CATEGORY 3 - The types of skill demonstrations required:

Percent range of total grade: 20 % to 25 %

Class Performance/s

Performance Exams

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

Percent range of total grade: 40 % to 50 %

Multiple Choice

True/False

REPRESENTATIVE TEXTBOOKS:

Required:

Amy Vickers, Handbook of Water Use and Conservation, WaterPlow Press, 2002, or other appropriate college level text. This is a standard text used in the water industry.

ISBN: 1-931579-07-5

Reading level of text, Grade: 11 Verified by: Dana Young

ARTICULATION and CERTIFICATE INFORMATION

Associate Degree:

CSU GE:

IGETC:

CSU TRANSFER:

Transferable CSU, effective 2012/70

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: 117

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: CCC000530894

Sports/Physical Education Course: N

Taxonomy of Program: 095800