GAVILAN COLLEGE
5055 Santa Teresa Blvd
Gilroy, CA 95023

Course Outline

COURSE: WTRM 233 DIVISION: 50 ALSO LISTED AS: WTRM 133

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

SHORT TITLE: WATER CONSERVATION

LONG TITLE: Water Conservation

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 provides technical and practical information in water use efficiency, the need for and major components of comprehensive water conversation programs and the role of the water conservation coordinator in the public water supply industry. Topics include: customers and their water uses, water sustainability factors, regulatory agencies and careers/opportunities in the field of water management. This class will help the student prepare for the AWWA Grade 1 Water Conservation Practitioner Certification. This course was previously listed as WTRM 133.

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. Identify the major issues confronting the California water supply industry, including the key stakeholders, and discuss the range of solutions that have been proposed to solve the problems.

Measure of assessment: written exam, homework, discussion

Year assessed, or planned year of assessment: 2018

Semester: Fall

2. Describe the regulatory framework that guides water conservation practices, the key elements of a water audit, and the key elements related to the design and management of successful conservation programs.

Measure of assessment: written exam, homework, discussion

Year assessed, or planned year of assessment: 2018

Semester: Fall

3. Explain various water conservation principles and practices sufficient to complete the AWWA Grade 1 Water Conservation Practitioner Certification process.

Measure of assessment: homework, exam

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

Curriculum Approval Date: 11/13/2018

6 Hours

Content: Water Issues in California: A comprehensive overview of the importance of water in California. With emphasis on current issues such as the ongoing drought, the hydrologic cycle and climate change, legal and environmental rulings reducing availability, and the politics of water and its impact on the need for water conservation.

Student Performance Objectives: Examine climate change and its effect on the drought. Discuss the hydrologic cycle. Describe various legal and environmental rulings which have affected the availability of water.

6 Hours

Content: Introduction and Scope/Water Agencies Roles in Conservation/Professional Association Regulations: Includes water consumers and uses; current industry issues - sources, agencies, regulations, resources; Best Management Practices; and distribution system audits.

Student Performance Objectives: Describe the essential uses of water. Name the major regulatory agencies that monitor and regulate the water industry. Describe the problems/constraints confronting the water purveyors. Identify water related issues confronting California. List the Best Management Practices contained in the Memorandum of Understanding Regarding Urban Water Conservation in California. Describe the regulatory rules that mandate water conservation practices based on approved water conservation guidelines.

6 Hours

Content: Residential and Landscape Water Use: Includes meters, indoor uses, retrofits, plumbing standards; horticultural principles and practices; xeriscape; irrigation systems; plant material; and landscape design.

Student Performance Objectives: Describe several ways that one can reduce water usage in a residential setting, both indoors and outdoors. Define xeriscape. List the key elements of xeriscape and natural landscape design and describe its use with water conservation programs.

6 Hours

Content: Customers and Water Uses/Water Resources: Customer base and classifications, uses, rates, conservation pricing, allocations, demand management; role of retail and wholesale water agencies.

Student Performance Objectives: List and state the role of various retail and wholesale water agencies in the area. Examine their rates and explain how they are determined.

8 Hours

Content: Residential and Landscape Water Use/Water Units Measures and Formulas: Includes ULF toilets - design, legislation, leaks, repairs retrofits; indoor water usage survey preparation; irrigation design, hardware, landscape measurement, water budgets calculating consumption and efficiency; irrigation controllers, scheduling water audits, landscape principles applied - field audit, written report, calculations.

Student Performance Objectives: Identify and describe at least five areas in residential buildings that are potential water wasting locations. Explain how and why water conservation efforts are shifting from indoor water conservation measures to outdoor water uses. Describe the key elements of a water audit. Perform basic mathematical formulas to assess water usage.

6 Hours

Content: Careers/Opportunities in Water Conservation and Sustainability Field: Jobs, Degrees/Majors. AND Field Surveys of Campus Grounds and Buildings, Nurseries and Water Conservation Gardens: Could include field trips to observe the use of water and conservation on campus and at surrounding area locations.

Student Performance Objectives: Review possible degrees/majors and/or careers/jobs in the field of water conservation and sustainability. Identify various water conservation efforts that are being used on campus. List various water conservation efforts that could be used by nurseries.

6 Hours

Content: Commercial, Industrial and Institutional Sites/Utility Water Conservation: Commercial, industrial and institutional customers, consumption, uses, practices, leak detection, landscape measures (gray water); mixed use meters; process uses, cooling towers, engineering estimates; CII survey methods.

Student Performance Objectives: Identify and describe at least five areas in commercial buildings that are potential water wasting locations. Explain water use in cooling towers. Describe how gray water systems work and state their benefits.

8 Hours

Content: Program Design and Management: Includes design and management of conservation programs - targeting, marketing, customer service, public education; cost-effectiveness analysis; links and partnerships with energy and wastewater; budget tracking reporting; research on conservation opportunities at area county water agencies.

Student Performance Objectives: List the major issues related to the design and management of successful conservation programs. Identify how source waters are obtained, treated and distributed.

Out-of-Class Assignments: Complete assigned readings on

topics.

2 Hours

METHODS OF INSTRUCTION:

lecture, discussion, multimedia presentations, guest speakers, field trips

OUT OF CLASS ASSIGNMENTS:

Required Outside Hours: 54

Assignment Description: Complete assigned readings on topics. Study for exams.

Required Outside Hours: 54

Assignment Description: Writing Assignments/Homework Examples: Write a 1-2 page paper on - a short history of water or the hydrologic cycle or climate change or California's drought. Homework: Review the most current copy of the CUWCC's Best

Management Practices and examine their performance as stated on the BMP reporting website. Homework examples: Chart your residential water consumption from inside your home including stating what you are doing, are not doing, or could be doing to conserve water. or Chart your residential water consumption on the outside of your home including stating what you are doing, are not doing, or could be doing to conserve water. Homework: Complete worksheet on topics specific to customers and water uses/water resources. Complete math problems worksheet. Homework examples: Investigate various

cost-effective, easy-to-install options for reducing water use inside the home. or Investigate what rebate programs water utilities may offer for the use of various water reducing items. Out-of-Class Assignments: Print a page from an industry related website that shows various career options. Homework examples: Explore the campus and investigate its water

conservation efforts and come prepared to discuss them in class. or Explore an area nursery and investigate its water conservation efforts and come prepared to discuss them in class. Homework examples: Visit a commercial or an industrial site and determine their water conservation practices/ use of gray water and come prepared to discuss them in class. Complete sample American Water Works Association Grade 1 Water Certification application form including taking practice test. Homework: Complete worksheet on topics specific to design and

management of conservation programs.

METHODS OF EVALUATION:

Writing assignments

Percent of total grade: 40.00 %

Percent range of total grade: 30% to 50% Written Homework

Problem-solving assignments

Percent of total grade: 10.00 %

Percent range of total grade: 10% to 30% Quizzes, Exams, Math Worksheet - Show work

Objective examinations

Percent of total grade: 50.00 %

Percent range of total grade: 40% to 60% Multiple Choice, True/False, Matching Items

Other methods of evaluation

Percent range of total grade: 0% to 10% Student Participation

REPRESENTATIVE TEXTBOOKS:

Required Representative Textbooks

California Urban Water Conservation Council. Memorandum of Understanding Regarding Urban Water Conservation in California. www.cuwcc.org, Amended September 17, 2014. 2014.

Water Conservation Plan Guidelines. U.S. EPA. Available for free at U.S. EPA website..

Yudelson, Jerry. Dry Run: Preventing the Next Urban Water Crisis. New Society Publishers,2010. ISBN: 978-0-86571-670-4

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: CCC000588886
Sports/Physical Education Course: N
Taxonomy of Program: 095800