GAVILAN COLLEGE
5055 Santa Teresa Blvd
Gilroy, CA 95023

Course Outline

COURSE: WTRM 201 DIVISION: 50 ALSO LISTED AS: WTRM 101

TERM EFFECTIVE: Summer 2024 CURRICULUM APPROVAL DATE: 06/11/2024

SHORT TITLE: WATER/WASTEWATER TECH INTRO

LONG TITLE: Introduction to Water, Wastewater Technology

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:

An introduction to the Water and Wastewater Distribution Industry. Topics include industry careers, required certifications, the hydrologic cycle, watersheds, water/wastewater treatment methods, valves and equipment, as well as industry standard math formulas and conversion factors. This course was previously listed as WTRM 101. ADVISORY: Skills equivalent to those in an Elementary Algebra course.

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. Define how industrial, commercial, and domestic water is used.

2. Illustrate the flow for water/wastewater treatment plant.

3. Describe industry networking and career opportunities, including state and voluntary certifications, their issuing organizations and acronyms utilized throughout the industry.

COURSE OBJECTIVES:

By the end of this course, a student should:

1. Describe the concept of potential networking, recognize professional and state organizations and the certifications offered and identify career opportunities locally, state wide, and nationally.

2. Identify the phases of the hydrologic cycle and the characteristics of water, describe the need for water quality standards and recognize and apply industry standard basic math formulas and conversions.

3. Identify the various forms of surface water and methods of surface water development, including the key factors associated with watersheds.

4. Explore the calculation of areas and volumes by converting cubic feet to gallons to pounds, including linear feet measurements, perimeters and circumference.

5. Identify the disinfection methods used in the water and wastewater industry, including the 3 forms of chlorine that are widely used (gas, liquid, dry). Students will explore the calculations of pounds for chlorine needed based on the percent strength of the chlorine used (gas, liquid, dry).

6. Describe the various forms of groundwater and describe water bearing formations and aquifers, including various types of wells and mechanical parts of the system.

7. Identify the various uses of water and the flow dynamics of water use based on time of day. Students will identify per-capita water use and explore the calculation for total volume of water used and percent of use by industry and / or population equivalents.

8. Identify the various types and use of pipes, couplings, and trenching/shoring requirements for underground pipe installation. Demonstration of identifying various types of pipe runs and placement of mechanical joints and kicker blocks. Understand the concern about overdraft conditions which can lead to \salt \water intrusion, and how nitrate contamination is caused from multiple sources.

9. Identify and describe the different types of pumps, valves, flow meters, and flow measurement and recording devices in the water/wastewater industry.

COURSE CONTENT:

Curriculum Approval Date: 06/11/2024

6 Hours

Content: Instructor and Student Introductions and Networking. Acronyms throughout the Industry. Career Opportunities. State and Voluntary Certifications and their Issuing Organizations.

State industry standard acronyms. Discussion of professional and state organizations and the certifications offered.

6 Hours

Content: Hydrologic Cycle. Characteristics of Water, Public Health and Water Quality. Outline the phases of the hydrologic cycle. Discussion of the characteristics of water and appreciate how water is critical to public health. Demonstration of the industry standard basic math formulas and conversions.

7 Hours

Content: Surface Water. Surface Water Development. Water Sheds. Intake Structures. Basic Math of volume and area.

Discussion of the key factors associated with watersheds and the utilized types of intake structures and overall systems' operation. Demonstration of calculating areas and volumes, including conversion of cubic feet to gallons to pounds, linear feet measurements, perimeters and circumference.

7 Hours

Content: Disinfection. Three Forms of Chlorine. Chlorine Safety. P.H. Scale and Measurement. Basic Math of pounds of chlorine.

Discussion of the key disinfection methods used in the water and wastewater industry, including the 3 forms of chlorine that are widely used (gas, liquid, dry) and how to safely handle and use of chlorine and personal protection equipment are required. Demonstration of how PH is measured and what each end of the PH scale represents. Demonstration of calculating pounds of chlorine needed based on the percent strength of the chlorine used.

8 Hours

Content: Ground Water. Ground Water Development. Wells. Similarities Between Water and Wastewater Treatment Processes. Basic well calculation.

Discussion of various forms of groundwater and defining water bearing formations and aquifers. Demonstration of various types of wells and mechanical parts of the system. Discussion of the similarities of treatment processes used both in the water and wastewater industry. Demonstration of calculation of well draw-down, specific yield, static water level and pumping water level, including pound per square inch (PSI).

6 Hours

Content: How Water is Used. Industrial, Commercial, and Domestic Water Use. Variations in Water Use. Basic Math of water demand.

Discussion of the various uses of water and the use of water based on the type of industry. Demonstration of the flow dynamics of water use based on time of day, per-capita water use and percent used by industry, including the calculation of population equivalents.

6 Hours

Content: Pipelines and Couplings. Pipeline Trenching and Installation. (Local) Water Issues - Nitrate Contamination and Salt Water Intrusion. Basic Math of detention time and flow rate.

Demonstration of various types and use of pipes, couplings used for joining pipes. Discussion about the outline of trenching/shoring requirements for underground pipe installation. Discussion of various types of pipe runs and placement of mechanical joints and kicker blocks. Discussion of the overdraft conditions which can lead to \salt \water intrusion and how nitrate contamination is caused from multiple sources. Demonstration of flow rate and detention time.

6 Hours

Content: Pumps. Valves. Flow Meters. Flow Measurement Devices and Recorders. Basic Math.

Demonstrate different types of pumps, valves, flow meters, and flow measurement and recording devices in the water/wastewater industry. Demonstration of calculating the velocity of moving water and converting temperature from degrees Fahrenheit to Centigrade, and from degrees Centigrade to Fahrenheit. Demonstrate the ability to manipulate dose, demand and residual formulas as applicable.

COURSE CONTENT (CONTINUED):
2 Hours
Final Exam.

METHODS OF INSTRUCTION:
Lectures and Discussions, Visual Aids, Demonstrations, Facilities Tours (as available)

OUT OF CLASS ASSIGNMENTS:
Required Outside Hours 54
Assignment Description
Read textbook and complete worksheets.

Required Outside Hours 28
Assignment Description
Study for quizzes and exams.

Required Outside Hours 26
Assignment Description
Homework problems and/or questions

METHODS OF EVALUATION:
Writing assignments
Evaluation Percent 30
Evaluation Description
30% - 40% Assignments, Discussions

Problem-solving assignments
Evaluation Percent 20
Evaluation Description
10% - 20% Assignments, Discussions

Objective examinations
Evaluation Percent 50
Evaluation Description
40% - 50% Multiple Choice, True/False, Matching Items

REPRESENTATIVE TEXTBOOKS:
Water and Wastewater Treatment: A Guide for the Non-Engineering Professional, Second Edition, or other appropriate college level text., Joanne E. Drinan, Frank R. Spellman, CRC Press, 2012 or a comparable textbook/material.
ISBN: 9781439854006
Rationale: This is the most current edition and a standard textbook for the water/wastewater 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: CCC000588725
Sports/Physical Education Course: N
Taxonomy of Program: 095800