GAVILAN COLLEGE
5055 Santa Teresa Blvd
Gilroy, CA 95023

Course Outline

COURSE: WTRM 102 DIVISION: 50 ALSO LISTED AS:

TERM EFFECTIVE: Fall 2018 **Inactive Course**

SHORT TITLE: WATER/WASTEWATER MATH 1

LONG TITLE: Beginning Water, Wastewater, Distribution Math

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 covers basic math concepts used in the water- wastewater-distribution industry. Topics include industry standard formulas, conversion factors, fractions, decimals, percentages, ratios, area and volume. This course is now listed as WTRM 202. ADVISORY: Eligible for Mathematics 205.

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. Apply mathematics such as addition, subtraction, multiplication, and division with whole numbers, decimals, and fractions used in the Water Industry.

Measure: Exams, Problems Assignments

ILO: 2, 3, 7

Year assessed, or planned year of assessment: Spring 2014

2. Utilize industry standard formula sheets and conversion factors. Convert cubic feet to gallons to pounds. Calculate the surface area in square feet of tanks and vessels.

Measure: Exams, Problems Assignments

ILO: 2, 3, 7

Year assessed, or planned year of assessment: Spring 2014

3. Calculate linear feet measurements, perimeters, and circumferences of tanks, vessels, and weirs. Calculate volume in cubic feet of tanks and vessels

Measure: Exams, Problems Assignments

ILO: 2, 3, 7

Year assessed, or planned year of assessment: Spring 2014

4. Calculate area in acres, volume in acre feet and convert square feet into acres, and cubic feet into acre feet. Calculate percent removal/efficiency of treatment processes. Identify peak flow, minimum flow, and calculate average daily flow.

Measure: Exams, Problems Assignments

ILO: 2, 3, 7

Year assessed, or planned year of assessment: Spring 2014

5. Calculate average industrial, commercial, and domestic water uses. Calculate gallons per day per capita. Calculate population equivalents. Calculate detention time for tanks and vessels.

Measure: Exams, Problems Assignments

ILO: 2, 3, 7

Year assessed, or planned year of assessment: Spring 2014

6. Calculate PSI in a well, tank or vessel. Convert feet of head into PSI. Calculate well draw down. Calculate temperature conversions from degrees Fahrenheit to Centigrade, and Centigrade to Fahrenheit

Measure: Exams, Problems Assignments

ILO: 2, 3, 7

Year assessed, or planned year of assessment: Spring 2014

7. Calculate dose, demand, residual in chemical application. Utilize the pounds formula to calculate pounds of chemicals, sludge and bacteria in the system. Calculate surface loading rate in gallons/day per square foot. Calculate weir overflow rate in gallons/day per linear foot of weir.

Measure: Exams, Problems Assignments

ILO: 2, 3, 7

Year assessed, or planned year of assessment: Spring 2014

8. Convert cubic feet into cubic yards. Calculate area, volume, gallons, and cubic yards of trapezoid shaped canals. Calculate velocity of moving water.

Measure: Exams, Problems Assignments

ILO: 2, 3, 7

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

Inactive Course: 11/13/2017

5 Hours Content: Review of basic mathematics: Addition, Subtraction, Multiplication, Division, with whole numbers, fractions, decimals and percentages.

Student Performance Objectives (SPO): Application of basic math concepts as they relate to Industry standard calculations.

Out-of-Class Assignments: For each topic, students will review in class and text book examples to complete hand-out homework assignments.

6 Hours Content: Review Industry Standard Formula Sheets used and provided when taking State Certification Exams. Identification of Conversion Factors used to convert Cubic Feet to Gallons to Pounds. Identify the Pounds Formula.

Student Performance Objectives (SPO): Identification and application of formulas needed to successfully solve word problems. Students will manipulate conversion factors to convert Cubic Feet to Gallons to Pounds. Students will solve problems using the Pounds Formula.

Out-of-Class Assignments: For each topic, students will review in class and text book examples to complete hand-out homework assignments.

6 Hours Content: Computation of Surface Area in Square Feet of Square, Rectangular, Circular tanks and the cross section of a Trapezoidal shaped canal. Computation of Surface Area in Acres of Square, Rectangular, Circular tanks.

Student Performance Objectives (SPO): Identification and application of formulas needed to successfully solve word problems.

Out-of-Class Assignments: For each topic, students will review in class and text book examples to complete hand-out homework assignments.

6 Hours Content: Computation of Volume in Cubic Feet of Square, Rectangular, Circular tanks and Trapezoidal shaped canals. Computation of Volume in Acre Feet of Square, Rectangular, Circular tanks and Trapezoidal shaped canals. Computation of Cubic Yards of Square, Rectangular, Circular tanks and Trapezoidal shaped canals.

Student Performance Objectives (SPO: Identification and application of formulas needed to successfully solve word problems.

Out-of-Class Assignments: For each topic, students will review in class and text book examples to complete hand-out homework assignments.

6 Hours Content: Computation of Linear Feet measurements, Perimeters, and Circumferences of tanks, vessels, and weirs. Calculate Percent (%) Removal/Efficiency of treatment processes.

Student Performance Objectives (SPO): Identification and application of formulas needed to successfully solve word problems.

Out-of-Class Assignments: For each topic, students will review in class and text book examples to complete hand-out homework assignments.

6 Hours Content: Computation of Average Industrial, Commercial, and Domestic Water Uses. Identify Peak Flow, Minimum Flow, and calculate Average Daily, Monthly, and Annual Flows. Calculate Gallons per Day per Capita. Calculate Population Equivalents.

Student Performance Objectives (SPO): Identification and application of formulas needed to successfully solve word problems.

Out-of-Class Assignments: For each topic, students will review in class and text book examples to complete hand-out homework assignments.

6 Hours Content: Calculate PSI in Wells, Tanks, and Vessels. Convert Feet of Head into PSI. Calculate Well Drawdown, Specific Yield, Pumping Water Level, and Static Water Level. Perform Temperature Conversions for Degrees C to Degrees F, and Convert Degrees F to Degrees C.

Student Performance Objectives (SPO): Identification and application of formulas needed to successfully solve word problems.

Out-of-Class Assignments: For each topic, students will review in class and text book examples to complete hand-out homework assignments.

6 Hours Content: Computation of Detention Time for Tanks and Vessels. Calculate Velocity of moving water. Calculate Surface Loading Rates in Gallons/Day per Square Foot. Calculate Weir Overflow Rates in Gallons/Day per Linear Foot of Weir.

Student Performance Objectives (SPO): Identification and application of formulas needed to successfully solve word problems.

Out-of-Class Assignments: For each topic, students will review in class and text book examples to complete hand-out homework assignments.

5 Hours Content: Manipulation of the Formulas above Forward, Backwards, and .Student

Performance Objectives (SPO): Identification and application of formulas needed to successfully solve word problems.

Out-of-Class Assignments: For each topic, students will review in class and text book examples to complete hand-out homework assignments.

2 Hours Final: Comprehensive Final Exam solving word problems.

METHODS OF INSTRUCTION:

Lecture and discussion

Visual Aids
Demonstrations
Class Participation
Quizzes
In class work sheets
Exams
Homework

METHODS OF EVALUATION:

CATEGORY 1 - The types of writing assignments required:
Percent range of total grade: 0 % to 0 %

If this is a degree applicable course, but substantial writing assignments are NOT appropriate, indicate reason:
Course is primarily computational
CATEGORY 2 - The problem-solving assignments required:
Percent range of total grade: 25% to 45 %
Homework Problems
Quizzes
Exams
Other: Class Participation
CATEGORY 3 - The types of skill demonstrations required:
Percent range of total grade: 10% to 25 %
Class Performance/s
CATEGORY 4 - The types of objective examinations used in the course:
Percent range of total grade: 30% to 50 %
Multiple Choice
True/False
Other: Math Computation

REPRESENTATIVE TEXTBOOKS:

Recommended Representative Textbooks
Frank R. Spellman. Mathematics Manual for Water and Wastewater Treatment Plant Operators, Second Edition, or other appropriate college level text. . CRC Press,2014.
NOTE: This is a standard text that is used in the water industry.
ISBN: 9781482224214
Reading Level of Text, Grade: 11th Verified by: Dana Young
Required Other Texts and Materials
Basic Math Concepts for Water and Wastewater Plant Operators, 2nd Edition by Joanne K. Price; Technomic Publishing Company; ISBN: 978-0877628088

ARTICULATION and CERTIFICATE INFORMATION

Associate Degree:
CSU GE:
IGETC:
CSU TRANSFER:
Transferable CSU, effective 201230

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: 102
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: CCC000528545
Sports/Physical Education Course: N
Taxonomy of Program: 095800