Course Outline

**COURSE:** WTRM 202  
**DIVISION:** 50  
**ALSO LISTED AS:** WTRM 102

**TERM EFFECTIVE:** Spring 2019  
**CURRICULUM APPROVAL DATE:** 10/9/2018

**SHORT TITLE:** WATER/WASTEWATER MATH 1

**LONG TITLE:** Beginning Water, Wastewater, Distribution Math

<table>
<thead>
<tr>
<th>Units</th>
<th>Number of Weeks</th>
<th>Contact Hours/Week</th>
<th>Total Contact Hours</th>
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</thead>
<tbody>
<tr>
<td>3</td>
<td>18</td>
<td>Lecture: 3</td>
<td>Lecture: 54</td>
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<tr>
<td></td>
<td></td>
<td>Lab: 0</td>
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<td></td>
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<td>Other: 0</td>
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<td>Total: 3</td>
<td>Total: 54</td>
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**COURSE DESCRIPTION:**

This course covers basic math concepts used in the water and wastewater distribution industry. Topics include industry standard formulas, conversion factors, fractions, decimals, percentages, ratios, area and volume. This course was previously listed as WTRM 102. **ADVISORY:** Eligible for Mathematics 430 or equivalent Arithmetic proficiency.

**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. Apply mathematics such as addition, subtraction, multiplication, and division with whole numbers, decimals, and fractions used in the Water Industry.
   Measure of assessment: Exams, Problem Worksheets, Homework
   Year assessed, or planned year of assessment: 2017
   Semester: Fall
2. Utilize industry standard formula sheets and conversion factors to successfully solve math problems.
   Measure of assessment: Exams, Problem Worksheets, Homework
   Year assessed, or planned year of assessment: 2017

CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS
Curriculum Approval Date: 10/9/2018
5 Hours
Content: Review of basic mathematics: Addition; Subtraction; Multiplication; Division, with whole numbers, fractions, decimals and percentages.
Student Performance Objectives: Apply basic math concepts as they relate to water industry standard calculations.
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: Identify and apply the formulas needed to successfully solve word problems. Manipulate conversion factors to convert Cubic Feet to Gallons to Pounds. Solve problems using the Pounds Formula.
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: Identify and apply the formulas needed to successfully solve word problems. Calculate the surface area in square feet of tanks and vessels. Convert cubic feet into cubic yards.
6 Hours
Student Performance Objectives: Identify and apply the formulas needed to successfully solve word problems. Calculate area, volume, gallons, and cubic yards of trapezoid shaped canals.
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: Identify and apply the formulas needed to successfully solve word problems. Calculate linear feet measurements, perimeters, and circumferences of tanks, vessels, and weirs. Calculate volume in cubic feet of tanks and vessels. 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.
6 Hours
Student Performance Objectives: Identify and apply the formulas needed to successfully solve word problems. 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. Calculate average industrial, commercial, and domestic water uses. Calculate gallons per day per-capita. Calculate population equivalents. Calculate detention time for tanks and vessels.

6 Hours
Content: Calculate PSI in Wells, Tanks, and Vessels. Convert Feet of Head into PSI. Calculate Well Draw-down, 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: Identify and apply the formulas needed to successfully solve word problems. 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.

6 Hours

Student Performance Objectives: Identify and apply the formulas needed to successfully solve word problems. Calculate weir overflow rate in gallons/day per linear foot of weir. Calculate the velocity of moving water.

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

Student Performance Objectives: Identify and apply the formulas needed to successfully solve word problems.

2 Hours

METHODS OF INSTRUCTION:
Lectures and Discussions, Visual Aids, Demonstrations

OUT OF CLASS ASSIGNMENTS:
Required Outside Hours: 36
Assignment Description: Review textbook examples and complete homework.
Required Outside Hours: 36
Assignment Description: Study for quizzes and exams.
Required Outside Hours: 36
Assignment Description: Solve math word problem worksheets.

METHODS OF EVALUATION:
Writing assignments
Percent of total grade: 0.00 %
Course is primarily computational
Problem-solving assignments
Percent of total grade: 30.00 %
Percent range of total grade: 20% to 40 % Homework Problems, Quizzes, Exams
Objective examinations
Percent of total grade: 50.00 %
Percent range of total grade: 30% to 50% Multiple Choice, True/False, Other: Math Computation
Other methods of evaluation
Percent of total grade: 20.00 %

REPRESENTATIVE TEXTBOOKS:
Recommended Representative Textbooks
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

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: CCC000588723
   Sports/Physical Education Course: N
   Taxonomy of Program: 095800