Course Outline

COURSE: WTRM 110  DIVISION: 50  ALSO LISTED AS:

TERM EFFECTIVE: Fall 2017  Inactive Course

SHORT TITLE: ADV WTR/WASTEWATER DIST MATH

LONG TITLE: Advanced 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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<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 is a continuation of the Beginning Water/Wastewater Mathematics course WTRM 102 and covers advanced math concepts used in the Water/Wastewater/Distribution industry. Topics include industry standard formulas, conversion factors, MCRT, SVI, waste/return, horsepower, well drawdown, capacitance, yield, belt press cake/filtrate, SDI, sludge age, gas production and digestion rates. This course is listed as WTRM 210, effective Fall 2017. ADVISORY: Math 205 Elementary Algebra and WTRM 102 Beginning Water/Wastewater Mathematics.

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. Review basic math concepts covered in the beginning class.
Measure: Quizzes, Exams, Homework Problems
PLO:
ILO: 3,2,7,6
2. Utilize Industry standard formula sheets and conversion factors. Convert Cubic Feet to Gallons to Pounds. Understand the Pounds Formula.
Measure: Quizzes, Exams, Homework Problems
PLO:
ILO: 3,2,7,6
3. Apply Trickling Filters and Rotating Biological Contactor Math.
Measure: Quizzes, Exams, Homework Problems
PLO:
ILO: 3,2,7,6
4. Utilize Activated Sludge Calculations.
Measure: Quizzes, Exams, Homework Problems
PLO:
ILO: 3,2,7,6
5. Apply Waste Treatment Ponds Math.
Measure:
PLO:
ILO: 3,2,7,6
6. Utilize Chemical Dosage Calculations.
Measure: Quizzes, Exams, Homework Problems
PLO:
ILO: 3,2,7,6
7. Apply Sludge Production and Thickening Calculations.
Measure: Quizzes, Exams, Homework Problems
PLO:
ILO: 3,2,7,6
8. Utilize Sludge Digestion Calculations.
Measure: Quizzes, Exams, Homework Problems
PLO:
ILO: 3,2,7,6
Measure: Quizzes, Exams, Homework Problems
PLO:
ILO: 3,2,7,6
Measure: Quizzes, Exams, Homework Problems
PLO:
ILO: 3,2,7,6

CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS
Inactive Course: 02/27/2017
Note: This course is listed as WTRM 210, effective Fall 2017.
3 Hours
Content: Apply mathematics such as addition, subtraction, multiplication, and division with whole numbers, decimals, and fractions used in the Water Industry. Review basic math concepts covered in the beginning class.

1/25/2018
Student Performance Objectives: Apply basic math concepts as they relate to Industry standard calculations.

3 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 formulas needed to successfully solve word problems. Manipulate conversion factors to convert Cubic Feet to Gallons to Pounds. Solve problems using the Pounds Formula.

4 Hours


Student Performance Objectives: Outline formulas needed to successfully solve word problems for unit process control.

6 Hours

Content: Activated Sludge Calculations. BOD and COD Loading, Solids Inventory, F/M Ratio, Sludge Age, SVI, MCRT, Return Sludge and Sludge Wasting Rates, Pumping Rates, and Oxidation Ditch Detention Time.

Student Performance Objectives: Identify formulas needed to successfully solve word problems for unit process control.

6 Hours


Student Performance Objectives: Outline formulas needed to successfully solve word problems for unit process control.

6 Hours

Content: Chemical Dosage Calculations. Chemical Feed Rate, Dose-Demand-Residual, Percent Strength of solution, Mixing Solutions of Different Strengths, Chemical Feed Pump Settings, Dry Chemical Feed Settings.

Student Performance Objectives: Identify formulas needed to successfully solve word problems for unit process control.

6 Hours


Student Performance Objectives: Explain formulas needed to successfully solve word problems for unit process control.

6 Hours


Student Performance Objectives: Identify formulas needed to successfully solve word problems for unit process control.

6 Hours


Performance Objectives: Outline formulas needed to successfully solve word problems for unit process control.

6 Hours

Student Performance Objectives: Identify formulas needed to successfully solve word problems for unit process control.
2 Hours

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 %
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: 0 % to 100 %
Homework Problems
Quizzes
Exams
Other: Class Participation
CATEGORY 3 - The types of skill demonstrations required:
Percent range of total grade: 0 % to 10 %
Class Performance/s
CATEGORY 4 - The types of objective examinations used in the course:
Percent range of total grade: 0 % to 100 %
Multiple Choice
True/False
Other: Math Computation

REPRESENTATIVE TEXTBOOKS:
Required:
Joanne Kirkpatrick Price, Basic math Concepts for water and wastewater plant operators, Technomic, 1991 (second edition), or other appropriate college level text. This text represents an industry standard text.
ISBN: 87762-808-4
Reading level of text, Grade: 11 Verified by: Dana Young

ARTICULATION and CERTIFICATE INFORMATION
Associate Degree:
CSU GE:
IGETC:
CSU TRANSFER:
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: 110
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: CCC000530892
Sports/Physical Education Course: N
Taxonomy of Program: 095800