Course Outline

COURSE:  WTRM 205      DIVISION:  50      ALSO LISTED AS:  WTRM 105

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

SHORT TITLE: WATER DISTRIBUTION 1

LONG TITLE: Water Distribution 1

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

This is a comprehensive course that teaches basic principles of operation and maintenance of a water distribution system. It covers the sources of water; principles of design; installation, operation and maintenance of pipes, pumps, valves, meters, and other regulated hydraulic units. Operation and maintenance safety considerations are emphasized. This course is designed to prepare the student to take the State of California Water Distribution Operator exam. This course was previously listed as WTRM 105.

ADVISORY: WTRM 201 Introduction to Water- Wastewater Technology and WTRM 202 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
  05 - Hybrid
  72 - Dist. Ed Internet Delayed

STUDENT LEARNING OUTCOMES:
1. Identify the fundamentals of water distribution systems from sources of supply to system layout, including hydraulic characteristics.
   Measure of assessment: Exam, Homework
   Year assessed, or planned year of assessment: 2018
   Semester: Fall
2. Solve basic mathematical calculations and conversions such as volume, water flow, pressure, and chemical dosage.
   Measure of assessment: Take-home graded assignments, Exams
   Year assessed, or planned year of assessment: 2018
3. This section does not contain any data.
   Demonstrate the ability to meet the written test standards for the State of California Water Distribution Operator exam.
   Measure of assessment: Quizzes, Exams, Worksheets
   Year assessed, or planned year of assessment: 2018

CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS
Curriculum Approval Date: 11/13/2018

3 Hours
Content: Distribution System Operations and Maintenance
   Student Performance Objectives: Outline an overview of the water distribution occupation. Identify the primary functions and responsibilities of water distribution operators.

3 Hours
Content: Distribution System and Design
   Student Performance Objectives: Outline the specifics of a water distribution systems plan. Describe proper waterworks technology. Diagram a typical water distribution system layout. Identify the sources of water available and their uses.

3 Hours
Content: Water Main Pipe
   Student Performance Objectives: Describe and compare different pipe characteristics. Compare types of pipes used and corresponding water quality issues.

3 Hours
Content: Distribution System Valves
   Student Performance Objectives: Describe and compare different types of valves in a water distribution system environment. Evaluate the impact of various water valves used in a distribution system.

3 Hours
Content: Water Main Installation
   Student Performance Objectives: Outline the challenges and procedures for installing water main pipe.

3 Hours
Content: Backfilling and Main Testing
   Student Performance Objectives: Outline the critical aspects involved with installing a water main.

3 Hours
Content: Water Storage
   Student Performance Objectives: Outline the different types of tanks and reservoirs used in a water distribution system. Describe the various types of storage facilities and operational use of each.

3 Hours
Content: Water Services, Meters, and Hydrants. Midterm.
   Student Performance Objectives: Describe water services and other elements used in a water distribution system.

3 Hours
Content: Distribution Math - Conversions
Student Performance Objectives: Demonstrate the ability to calculate and convert various water measurements.
3 Hours
Content: Distribution Math - Area and Volume

Student Performance Objectives: Calculate areas and volumes commonly found in water industry environments.
3 Hours
Content: Distribution Math - Pressures and Flows

Student Performance Objectives: Calculate pressure and flow, as used in a water distribution system.
3 Hours
Content: Distribution Math - Introduction to Dosage, Temperature

Student Performance Objectives: Describe and demonstrate chlorine dosage and temperature calculations.
3 Hours
Content: Distribution System Hydraulics

Student Performance Objectives: Outline the key simple hydraulic principles used in a distribution system design.
3 Hours
Content: Traffic Control

Student Performance Objectives: Outline traffic control requirements and associated safety issues.
3 Hours
Content: Cross Connection, Security, Emergency Preparedness and Response

Student Performance Objectives: Describe operational problems involved with running a water distribution system.
3 Hours
Content: Public Relations, Administration, Customer Service

Student Performance Objectives: Prepare an overview of administrative issues related to operating a water distribution system.
2 Hours

METHODS OF INSTRUCTION:
Lectures and discussions, Visual Aids, Demonstrations, Facilities Tours (as available), In class work sheets

OUT OF CLASS ASSIGNMENTS:
Required Outside Hours: 54
Assignment Description: Read related textbook chapters and handouts. Study for exams.
Required Outside Hours: 54
Assignment Description: Homework/Problem Solving: Take home design assignment. Math homework problems.

METHODS OF EVALUATION:
Writing assignments
Percent of total grade: 10.00 %
Percent range of total grade: 10% to 20% Written Homework: Worksheets, Other: Design project
Problem-solving assignments
Percent of total grade: 30.00 %
Percent range of total grade: 30% to 50% Homework Problems, Quizzes
Skill demonstrations
Percent of total grade: 10.00 %
Percent range of total grade: 0% to 20% Demonstration Exams
Objective examinations
Percent of total grade: 50.00%
Percent range of total grade: 40% to 60% Multiple Choice, Other: Math problems - Show work

REPRESENTATIVE TEXTBOOKS:
Required Representative Textbooks
NOTE: This is a standard text used in the water industry.
ISBN: 1583219544
Reading Level of Text, Grade: 10th Verified by: Dana Young

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: CCC000588727
Sports/Physical Education Course: N
Taxonomy of Program: 095800