WTR 111 Course Outline as of Fall 2017

CATALOG INFORMATION

Dept and Nbr: WTR 111 Title: WATER DISTRIBUTION OPER
Full Title: Water Distribution System Operator
Last Reviewed: 2/13/2023

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	6	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00 Total Student Learning Hours: 157.50

Title 5 Category:	AA Degree Applicable
Grading:	Grade Only
Repeatability:	00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:	
Formerly:	ENVT 111

Catalog Description:
This course provides training in the knowledge and skills required to safely operate a potable water distribution system. Course covers components of water distribution system facilities, flow in pipes, storage facilities, pumps, instrumentation and control, distribution system operation and maintenance, distribution system water quality, safety, and record keeping. Prepares students for the State of California certification examination for Water Distribution System Operator.

Prerequisites/Corequisites:
Course Completion or Current Enrollment in WWTR 112

Recommended Preparation:

Limits on Enrollment:

Schedule of Classes Information:
Description: This course provides training in the knowledge and skills required to safely operate a potable water distribution system. Course covers components of water distribution system facilities, flow in pipes, storage facilities, pumps, instrumentation and control, distribution system operation and maintenance, distribution system water quality, safety, and record keeping.

Prepares students for the State of California certification examination for Water Distribution System Operator. (Grade Only)
Prerequisites/Corequisites: Course Completion or Current Enrollment in WWTR 112
Recommended:
Limits on Enrollment:
Transfer Credit:
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**	Effective:	Inactive:
CSU GE:	**Transfer Area**	Effective:	Inactive:
IGETC:	**Transfer Area**	Effective:	Inactive:

CSU Transfer:	Effective:	Inactive:
UC Transfer:	Effective:	Inactive:

CID:

Certificate/Major Applicable:
Both Certificate and Major Applicable

COURSE CONTENT

Student Learning Outcomes:
At the conclusion of this course, the student should be able to:
1. Operate all facilities in a potable water distribution system classified by the State of California as a Certified D1 Operator or Certified D2 Operator system.
2. Assess the physical condition of the D1 or D2 potable water distribution system, correctly diagnose system problems, and take effective corrective action to resolve those problems.
3. Recognize water quality problems in a potable water distribution system, identify the cause(s) of the problems and select the appropriate action to resolve the problem.
4. Generate and maintain all required records involved with the operation of a D1 or D2 potable water distribution system and submit the appropriate data to the State of California in a complete and timely manner.

Objectives:
1. Identify all the major components that make up a potable water distribution system, understand the purpose of each and be able to operate these components.
2. Determine head loss in common piping configurations used in potable water distribution systems.
3. Identify and describe pipe materials, valves, and storage facilities used in potable water distribution systems.
4. Identify and specify appropriate pumps, instruments and control systems.
5. Determine if the physical facilities in a potable water distribution system are operating correctly.
6. Disinfect new and existing wells, pumps, mains, and storage facilities; calculate chlorine dosages.
7. Identify and remove contaminants from a potable water distribution system.

8. Develop, conduct, and keep records for a potable water distribution system water quality monitoring program.
9. Conduct an effective flushing program.
10. Determine safety issues relative to a specific D1 or D2 potable water distribution system and conduct an effective safety program to prevent on the job injuries.

Topics and Scope:

I. Introduction
   A. Overview of potable water distribution systems
   B. Roles and responsibilities of the Distribution System Operator
   C. Certification of Distribution System Operators
II. Distribution System Facilities
   A. Water mains and appurtenances
   B. Pipe installation
   C. Valves, fire hydrants, meters
III. Flow in Pipes
   A. Hydraulic and energy grade line
   B. Friction loss
IV. Storage Facilities
   A. Types and purpose
   B. Operation, maintenance, and inspection
   C. Removal and return to service
   D. Water quality sample collection
   E. Disinfection
V. Centrifugal pumps
   A. Principles of operation
   B. Operation and maintenance
   C. Specifying for potable water distribution system applications
VI. Instrumentation and Control
   A. Types and purpose
   B. Primary sensors
   C. Telemetry and display
   D. Control systems
VII. Distribution System Operation and Maintenance
   A. Surveillance programs
   B. Water quality monitoring programs
   C. Cross-connection control programs
   D. Locate, repair, flush and clean distribution system mains
   E. Test and read meters
   F. Disinfect mains and storage facilities
   G Record keeping
VIII. Water Quality Considerations
   A. Types and sources of contaminants in distribution systems
   B. Causes and corrective action to eliminate water quality degradation
IX. Disinfection
   A. Disinfection of water system facilities
   B. Chlorine dosage calculations
   C. Operate and maintain hypochlorinators and gas chlorinators
   D. Trouble shooting chlorination systems
   E. Chlorine safety
X. Safety

A. Potable Water Distribution System Safety Program
B. Personal safety
C. Safety around common distribution system facilities
D. Working in streets

XI. Record Keeping (Measurements)
A. Operational records
B. Maintenance records
C. Regulatory compliance records

Assignment:

1. Reading assignments, approximately 10-20 pages per week
2. Reading comprehension assignments (5-15)
3. Problem solving homework assignments (5-15)
4. Quizzes (5-15)
5. Final exam

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments are more appropriate for this course.	Writing 0 - 0%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problems, reading comprehension assignments	Problem solving 30 - 50%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None	Skill Demonstrations 0 - 0%

Exams: All forms of formal testing, other than skill performance exams.

Quizzes and final	Exams 40 - 60%

Other: Includes any assessment tools that do not logically fit into the above categories.

Class participation	Other Category 0 - 10%

Representative Textbooks and Materials:
Water Treatment Operators Training Handbook. 3rd ed. Pizzi, Nicholas and Lauer, William.

American Water Works Association. 2013
Water Treatment Plant Operation (A Field Study Training Program) Vol. 1. 6th ed. Kerri, Kenneth. University Enterprises, Inc. 2008 (classic)