

WATR 153: WATER RESOURCES AND DISTRIBUTION II

Citrus College Course Outline of Record

Heading	Value
Effective Term:	Fall 2023
Credits:	3
Total Contact Hours:	54
Lecture Hours :	54
Lab Hours:	0
Hours Arranged:	0
Outside of Class Hours:	108
Strongly Recommended:	WATR 150 and WATR 151.
Transferable to CSU:	No
Transferable to UC:	No
Grading Method:	Standard Letter, Pass/No Pass

Catalog Course Description

A course in practical water supply with emphasis on the basic principles of hydraulics. The course will focus on clarifying pressure, head, buoyancy, friction loss, forces, velocity of flow and the size capacity relationship of distribution systems. The study of pump characteristics, sizing of pumps, water chemistry, water treatment, arithmetic, chemical treatment, and efficiency test procedures are included. Typical calculations include line loss in series and parallel pipe systems, residual pressure, forces on thrust blocks, and horsepower requirements for pumps. This course prepares students for the State Water Resources Control Board D4 and D5 Water Distribution Operator's certification. 54 lecture hours.

Course Objectives

- Explain the basic theory of hydraulics as applied to the development and operation of water systems
- Identify the methods used to evaluate water system facilities
- Develop a plan to expand an existing water distribution facility
- Identify the proper positive leak detection method and necessary repairs
- Understand facility fire requirements and an underwriter's ratings
- Explain metering methods of water flow and describe the system for calculating and recording volume

Major Course Content

1. Introduction
 - a. Content
 - b. Full discussion of course prerequisites
 - c. Historical development of water supply
2. Water Sources
 - a. Industry
 - b. Domestic
 - c. Projected demands: peak hourly, daily and annually
3. Unaccounted for Water

- a. System of records
 - b. Meter testing
4. Calculator: It's Use and Benefits for Water Works Problems
 5. Types of Water Wells and Well Drilling Methods
 6. Well Repair and Maintenance
 - a. Falling water
 - b. White water
 - c. Red water
 - d. Best use of wells
 7. Well Testing: Field Trip for Actual Well and Pump Test
 8. Pump Operation, Installation and Maintenance
 9. Turbine Deep Well and Booster Pumps
 10. Specification Writing and Evaluation of Bids
 11. Leak Detection and Methods of Repair
 12. Method and Procedure of Flushing Mains
 13. Corrosion
 14. Valves, Meters and Devices for Automatic Controls
 15. Fire Requirements and Underwriters' Ratings
 16. Disinfection of Pipelines and Storage Reservoirs

Suggested Reading Other Than Required Textbook

California State Water Resources Control Board website and media releases; American Water Works Association website and articles.

Examples of Required Writing Assignments

Explain the theory of hydraulics as applied to the development and operation of water systems; identify the methods used to evaluate water system facilities; develop a plan to expand an existing water facility.

Examples of Outside Assignments

Explain the theory of hydraulics as applied to the development and operation of water systems; identify the methods used to evaluate water system facilities; develop a plan to expand an existing water facility.

Instruction Type(s)

Lecture, Online Education Lecture