

WATER TECHNOLOGY

Water Technology, a career technical program, prepares students for entry-level employment or advancement in the public water sector, including the distribution and treatment of water. Those already employed in the industry may use course credit as contact hours for license renewals. Courses prepare students to take the State Water Resources Control Board certification examinations to qualify as a water distribution system operator or a water treatment operator. Courses also prepare students for grades I and II of the American Water Works Association's Water Use Efficiency Practitioner certification examinations. Courses in this discipline lead to either an A.S. Degree or Certificate of Achievement in Water Technology or an A.S. Degree or Certificate of Achievement in Water Efficiency Management. Students who complete the program are permitted to reduce field experience requirements for state certification, thus leading to accelerated career advancement.

Faculty

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<https://www.citruscollege.edu/academics/programs/watertech> (<https://www.citruscollege.edu/academics/programs/watertech/>)

Learning Outcomes

This discipline prepares students to do the following:

- Demonstrate the safe handling of chemicals used in the Water industry and describe the Occupational Safety and Health Administration (OSHA) regulations related to public drinking water.
- Describe and explain regulatory issues that relate to the public drinking water supply.
- Diagram and explain the fundamentals of the water distribution system including SCADA (supervisory control and data acquisition), maintenance, pumps, hydraulics, and valves.
- Given a scenario involving water contamination; identify the contaminants, recommend the best treatment, administer the treatment and then verify the contaminants are below allowable safety thresholds.

Courses

WATR 150

Introduction to Water Systems

3 Units (AA/AS)

54 lecture hours

Grade Mode: Pass/No Pass, Standard Letter

Strongly recommended: ENGL 101.

A basic course in water distribution and treatment covering water quality control practices, water sources, public health aspects of water regulations, supply, water treatment arithmetic, chemical treatment, filtration, corrosion, disinfection, tastes and odors in water, water system operation and maintenance, valves, pipes, pumps, and meters. The material covered in this course will be helpful to those preparing for the California State Water Resources Control Board (SWRCB) D-1 and D-2 Water Distribution Operator's Certificate examinations and the T-1 and T-2 Water Treatment Operator's Certificate examination.

WATR 151

Water Resources and Distribution I

3 Units (AA/AS)

54 lecture hours

Grade Mode: Pass/No Pass, Standard Letter

Strongly recommended: WATR 150; MATH 144.

A course designed for water distribution systems operators. Topics include: water production, types of reservoirs, water lines, pumps, water chemistry, water treatment, arithmetic, chemical treatment, appurtenances, method of installation, repair of facilities, back up theory, and administrative functions behind the distribution system. This course prepares the student for the D2 and D3 Water Distribution Operator's examinations administered by the State Water Resources Control Board.

WATR 153

Water Resources and Distribution II

3 Units (AA/AS)

54 lecture hours

Grade Mode: Pass/No Pass, Standard Letter

Strongly recommended: WATR 150 and WATR 151.

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.

WATR 156**Water Treatment I****3 Units (AA/AS)****54 lecture hours****Grade Mode: Pass/No Pass, Standard Letter***Strongly recommended: WATR 150.*

This course covers water resources, water quality, unit operations of water treatment, public health requirements, and the basics of water chemistry and aquatic microbiology. It prepares students for the T1, T2, and T3 Water Treatment Operator's Certificate and the D1, D2 and D3 Water Distribution Operator's Certificate examinations given by the California State Water Resources Control Board.

WATR 157**Water Treatment II****3 Units (AA/AS)****54 lecture hours****Grade Mode: Pass/No Pass, Standard Letter***Strongly recommended: WATR 156.*

This is a course covering water resources, water quality, unit operations of advanced water treatment systems, public health, water chemistry and microbiology, and fluoridation. This course prepares students for the T3, T4, and T5 Water Treatment Operator's Certificate given by the California State Water Resources Control Board (Ca SWRCB). This course may also be used to apply to take all levels of the Water Distribution Operator's Certificate examinations given by the Ca SWRCB.

WATR 162**Water Use Efficiency I****3 Units (AA/AS)****54 lecture hours****Grade Mode: Pass/No Pass, Standard Letter**

This course provides an overview and technical information on the role of the water efficiency coordinator or similar position in the public or private sector. Topics include: water supply and cycle, structure and operations of utilities, regulatory agencies, best management practices, water conservation programs and technologies. This course will prepare the student for the American Water Works Association (AWWA) grade 1 Water Use Efficiency Practitioner Certification.

WATR 164**Water Use Efficiency II****3 Units (AA/AS)****54 lecture hours****Grade Mode: Pass/No Pass, Standard Letter**

Prerequisite(s): WATR 162 or Grade 1 Water Use Efficiency Practitioner Certification or consent from the department based upon sufficient experience in the water industry.

This course covers the implementation and monitoring of water use efficiency programs utilized by water conservation coordinators in the public and private sectors. Topic areas include: California Water Code and current conditions and legislation impacting the State's water supplies, measuring the cost-benefit of conservation programs, monitor water saving results, development and implementation of water shortage measures and strategic plans, review of water rates structures to encourage conservation, review of non-potable water supplies, and use of new technologies to reduce overall water demand in the urban sector. This course will prepare students for the California/Nevada American Water Works Association (AWWA) Grade 2 Water Use Efficiency Practitioner Certification exam.

Programs

Associate Degrees

- A.S. in Water Efficiency Management (<http://catalog.citruscollege.edu/disciplines/water-technology/water-efficiency-management-as/>)
- A.S. in Water Technology (<http://catalog.citruscollege.edu/disciplines/water-technology/water-technology-as/>)

Certificates of Achievement

- Certificate in Water Efficiency Management (<http://catalog.citruscollege.edu/disciplines/water-technology/water-efficiency-management-certificate-achievement/>)
- Certificate in Water Technology (<http://catalog.citruscollege.edu/disciplines/water-technology/water-technology-certificate-achievement/>)