

## CA-NV Section AWWA In-Class Courses and Descriptions

### **Introduction to Water Distribution**

This class offers 3.6 CEUs.

Overview: This 36-hour course provides a comprehensive introduction to water distribution systems for Water Distribution Operators at the apprenticeship level. Participants learn key concepts and terms in topic areas including: State and Federal regulations; water sources; system design and mapping; wells; hydraulics; pipes, main installations and rehabilitation; backfilling, main testing, and installation safety; water services; valves, hydrants, pumps and motors; meters; water storage; instrumentation and controls; chlorination and water quality testing; backflow prevention; and water distribution system operation. The essentials of water mathematics are introduced throughout the course to increase student skills in using formulas and conversion factors on the job.

**Suggested Prerequisites:** HS diploma and/or GED; basic math skills

### **Introduction to Water Treatment**

This class offers 3.6 CEUs.

Overview: This 36-hour course provides a comprehensive introduction to water and related treatment systems for Water Treatment Operators at the small system operator and apprenticeship levels and those desiring to secure employment as a water treatment operator. Participants learn key concepts and principles in topic areas including: State and Federal regulations; water sources and multiple-barrier approach; treatment processes, including pre-treatment, coagulation and flocculation, sedimentation and filtration; water treatment math; disinfection; basic chemistry; introduction to iron and manganese treatment; fluoridation; introduction to specialized treatment processes; pumps; corrosion control; treatment plant safety and administration. The essentials of water mathematics are introduced throughout the course to increase student skills in using formulas and conversion factors on the job.

**Suggested Prerequisites:** HS diploma and/or GED; basic math skills

## Intermediate Water Distribution

This class offers 3.6 CEUs.

Overview: This 36-hour course focuses on managing the supply and transmission operations of water distribution systems. This highly-interactive course is designed for Water Distribution Operators at the apprenticeship level desiring to achieve journey person status; journey persons; and those desiring to secure employment as a senior level water distribution operator. Using the foundational principles taught in the introductory course, participants apply the theory learned and build critical skills required in water transmission and distribution management. Topic areas include: State and Federal water regulations; water system design; hydraulics; instrumentation and control; motors and engines; meters; water sources and supply; water quality; disinfection; safety and emergency response; administration; public relations; identification, analysis, and problem resolution associated with the day-to-day operations and maintenance of a water distribution system. Relevant water mathematics formulas and problem-solving are reinforced throughout the course to increase skill level on the job.

**Suggested Prerequisites:** Successful completion of an Introduction to Water Distribution class (or equivalent) and/or at least 1 year of experience as a D1 operator or 6 months as a D2 operator; basic math skills including algebra and geometry skills, and basic proficiency with water conversion factors and water formulas.

## Intermediate Water Treatment

This course offers 3.6 CEUs.

Overview: This 36-hour interactive course is designed for Water Treatment Operators at the apprenticeship level desiring to achieve journey person status; journey persons; and those desiring to secure employment as a senior level water distribution operator. Participants learn principles in topic areas including: a brief review of basic water treatment processes, including pre-treatment, disinfection, filtration, coagulation and flocculation, and sedimentation; State and Federal regulations; advanced treatment methods, including lime softening, corrosion control, ion exchange, activated carbon, aeration, membrane filtration, ozone, UV, and other oxidant applications; plant waste treatment and disposal; water supply management; administration. Relevant water mathematics formulas and problem-solving are reinforced throughout the course to increase skill in using formulas and conversion factors on the job.

**Suggested Prerequisites:** Successful completion of an Introduction to Water Treatment class (or equivalent) and/or at least 1 year of experience as a T1 operator or 6 months as a T2 operator; basic math skills including algebra and geometry skills, and basic proficiency with water conversion factors and water formulas.

## **Backflow Assembly Backflow Prevention Tester Course**

[This class offers 3.6 CEUs.](#)

Overview: This 40-hour course provides the testing and maintenance methods for backflow prevention assemblies. This course is one-half lecture and one-half hands-on training. It covers the crucial points of backflow prevention programs that are suitable for both large and small water companies. Participants will learn how to recognize various backflow prevention devices and the proper procedures for testing each device type under a variety of test conditions. This course will review the rules, codes, and regulations related to cross-connection and backflow requirements, including Title 17 of the CCR and the Uniform Plumbing Code.

**Suggested Prerequisites:** Basic math skills including algebra and geometry.

## **Backflow Refresher**

[This class offers 8.0 Contact Hours.](#)

Overview: Topics include, but are not limited to, backflow prevention and methods, hydraulics and theory, regulations and codes, system protection, field test procedures, safety, troubleshooting and hands-on testing.

**Suggested Prerequisites:** Attendees must have previously completed a 40-hour Backflow Course.

## **Cross-Connection Control Specialist Workshop**

[This course offers 3.6 CEUs.](#)

Overview: This 36-hour course is the continuation of the Backflow Assembly Backflow Prevention Tester Course. As recycled/reclaimed water becomes an important resource to be utilized in the correct manner, the cross connection control specialist will be integral to implementing changes protecting the potable water supply from being cross connected to recycled/reclaimed water sources. Title 22, California Code of Regulations (rule and regulations regarding recycled water), does require that a recycled water system program be supervised by a cross connection control specialist. Additional emphasis is directed towards the identification, location and abatement of actual and potential cross connections.

**Suggested Prerequisites:** Attendees must be Backflow Tester Certified.

## **Water Use Efficiency Grade 1 Workshop**

[This class offers 16.0 Contact Hours.](#)

Overview: This two-day workshop is for those who have a basic understanding of the water industry and want to build a deeper knowledge of the water supply in the Western United States, the roles different agencies play in supply and conservation, and basic conservation measures for Residential, CII, and Landscaping. The class covers different types of conservation programs, and discusses various strategies depending on the type of organization and the desired results. Throughout the class, various types of water math problems are reviewed as they apply to water conservation calculations.

## **Water Use Efficiency Grade 2 Workshop**

[This class offers 16.0 Contact Hours.](#)

Overview: This two-day workshop is for those who have a good understanding of water conservation in the Western United States, and want a better understanding of program management. In addition to discussions regarding landscape conservation and CII conservation, program implementation and monitoring, as well as program planning and reporting, are discussed.

## **Water Distribution Review, Grades 1 & 2**

[This class offers 8.0 Contact Hours.](#)

Overview: This one-day workshop provides students with an overview of the materials that will be covered on the CA State D1-D2, as identified by the Division of Drinking Water Range of Knowledge. Topics include, but are not limited to, water distribution mathematics, distribution system operation, sources of supply, elementary water quality, disinfection, pumps and motors, electricity.

The student will receive comprehensive review material.

## **Water Treatment Review, Grades 1 & 2**

[This class offers 8.0 Contact Hours.](#)

Overview: This one-day workshop provides students with an overview of the materials that will be covered on the CA State T1-T2 exam, as identified by the Division of Drinking Water Range of Knowledge. Topics include, but are not limited to, California water regulations, water sources, watershed management, water storage, basic limnology, applied water chemistry, applied water mathematics, water treatment technologies, filtration methods, treatment chemicals, process equipment, plant safety, water quality and monitoring requirements, laboratory tests and interpretation, bacteriological sampling procedures, microbiology, disinfection, CT

concepts and CT calculation, hardness removal, blending, jar testing procedures, distribution system operations, cross-connection and corrosion prevention, and the public health aspects of a potable water supply.

Students will receive comprehensive review material.

### **Water Distribution Review, Grades 3 & 4**

[This class offers 8.0 Contact Hours](#)

Overview: This one-day workshop provides students with an overview of the materials that will be covered on the CA State D3-D4, as identified by the Division of Drinking Water Range of Knowledge. Topics include, but are not limited to, water distribution mathematics, groundwater and surface supplies, SCADA, disinfection, piping, distribution systems operation.

Students will receive comprehensive review material.

### **Water Treatment Review, Grades 3 & 4**

[This class offers 8.0 Contact Hours.](#)

Overview: This one-day workshop provides students with an overview of the materials that will be covered on the CA State T3-T4 exam, as identified by the Division of Drinking Water Range of Knowledge. Topics include, but are not limited to, California water regulations, water sources, advanced watershed management, water storage, basic limnology, applied advanced water chemistry, applied advanced water mathematics, advanced water treatment technologies, advanced filtration methods, treatment chemicals, process equipment, plant safety, water quality and monitoring requirements, laboratory tests and interpretation, bacteriological sampling procedures, microbiology, disinfection, CT concepts and CT calculation, hardness removal, blending, jar testing procedures, distribution system operations, cross-connection and corrosion prevention, and the public health aspects of a potable water supply.

Students will receive comprehensive review material.

### **Water Distribution Math Review, Grades 1 & 2**

[This class offers 4.0 Contact Hours.](#)

Overview: This workshop provides students with an overview of the math materials that could be covered on the CA State D1-D2 exam. Students will receive comprehensive review material.

This workshop provides a solid review of how to approach math problems, units of measure, conversion factors, common formulas, dimensional analysis, linear

measurement, areas, volumes, well drawdown, specific capacity, and simple flow rates. This workshop also reviews simple math concepts related to more challenging water math problems, including force and pressure calculations, chemical dosages, solutions and concentrations, pumping and horsepower, percentages, and applied math practice problems.

### **Water Distribution Math Review, Grades 3 & 4**

[This class offers 4.0 Contact Hours.](#)

Overview: This workshop provides students with an overview of the math materials that could be covered on the CA State D3 – D4 exam. Students will receive comprehensive review material. This workshop provides a strong review of D1/D2 math concepts, then covers more advanced math concepts related to flow rates, chemical dosages, pumping and horsepower, wire to water efficiency and cost calculations, milliAmp calculations, two-normal calculations, specific gravity, and applied math practice problems.

### **Water Treatment Math Review, Grades 1 & 2**

[This class offers 4.0 Contact Hours.](#)

Overview: This workshop provides students with an overview of the math materials that could be covered on the CA State T1-T2 exam. Students will receive comprehensive review material. This workshop provides a solid review of how to approach math problems, units of measure, conversion factors, common formulas, dimensional analysis, linear measurement, areas, volumes, and simple flow rates. This workshop also reviews simple math concepts related to more challenging water math problems, including chemical dosages, detention times, solutions, percentages, pressure/head conversions, filter math, CT concepts, and applied math practice problems.

### **Water Treatment Math Review, Grades 3 & 4**

[This class offers 4.0 Contact Hours.](#)

Overview: This workshop provides students with an overview of the math materials that could be covered on the CA State T3-T4 exam. Students will receive comprehensive review material. This workshop provides a strong review of T1/T2 math concepts, then covers more advanced math concepts related to flow rates, chemical dosages, detention times and surface loading rates, solutions, percentages, pressure/head conversions, filtration and backwash calculations, CT and log removal, and applied math practice problems.

## **Groundwater Workshop**

This class offers 8.0 Contact Hours.

Overview: This workshop provides students with an overview of groundwater aspects that pertain to the drinking water industry. The workshop identifies groundwater sources & discusses factors which influence water quality & quantity, and includes a review of common groundwater management practices. In addition, regulatory requirements & current legislation intended to address overdraft issues, groundwater recharge, and groundwater protection are discussed. The workshop also presents an overview on groundwater well design & construction methods, as well as pump & motor equipment. It ends with a selection of water quality issues specific to groundwater systems, i.e., iron, manganese, nitrate, chloride, conductivity & hardness. Treatment processes such as chloramination, fluoridation, pH adjustment & corrosion control will be discussed. Finally, issues related to the mixing of two different source waters, surface water & groundwater, will be discussed. At the end of the workshop, attendees should have a clearer understanding of groundwater sources and issues related to managing these sources.

## **Water Quality Workshop**

This class offers 8.0 Contact Hours.

Overview: The Water Quality workshop provides students with a solid overview of water quality aspects that pertain to drinking water quality. The workshop begins an introduction on source water types, followed by a review of the key physical, chemical and microbial water quality parameters, including background information, definitions, characteristics, removal or control, and monitoring. Topics addressed include physical, chemical and microbial water quality parameters or classes of parameters, their origins and occurrence, significance, control, and analyses. The workshop also presents an overview on disinfectants/oxidants and disinfection by-products. It ends with a selection of water quality issues specific to distribution systems, i.e., microbial regrowth, nitrification, and corrosion. As appropriate, each section will be completed with tools and a list of references for additional reading. At the end of the workshop, attendees should have a clearer understanding of the various parameters that assess drinking water quality, their importance and significance, and overall removal strategies and monitoring.

**Suggested Prerequisites:** High School diploma and/or GED; Basic understanding of drinking water treatment.

## Water Regulations Workshop

This class offers 8.0 Contact Hours.

Overview: The objective of the Water Regulations workshop is to provide attendees with an overview of current and upcoming State and Federal Regulations pertaining to drinking water. This includes health effects, definitions, regulatory agencies, the regulatory process, and notification requirements. Regulations covered include The SWTR, TCR and Revised TCR, LT1, LT2 ESWTR, DBP Rule, Lead and Copper, NPDES, TMDLs, Title 17 (backflow) and regulations that pertain to Inorganic and organic chemicals, radionuclides, Primary and Secondary Standards. This includes monitoring requirements and approaches, as well as a segment on water discharge requirements in the State of California. At the end of the workshop, attendees should be able to clearly define the various parameters that assess drinking water quality, their importance and significance, regulatory limits, and analytical methods.

**Suggested Prerequisites:** High School diploma and/or GED. Basic understanding of drinking water treatment.