

WATER SCIENCE

The WS program provides students with the technical training they need to pursue a career in the municipal potable water and wastewater industries. Waterworks operators protect public health by ensuring that plant operations comply with state and federally mandated drinking water and wastewater disposal standards. Students seeking an Associate Degree in Water Science may choose the Water option to prepare them for a career in potable water treatment or the Wastewater option to prepare them for a career in wastewater sanitation. Regardless of the option chosen, both paths lead to rewarding careers protecting the health of both the community and the environment at local, state, and federal levels.

WS V10 Basic Water and Wastewater Systems 3 Units

In-Class Hours: 52.5 lecture

This course is a study of water and wastewater utility systems. Subjects to be studied will include open channel flow, pressure pipe systems, and other basic elements including storage, treatment processing, delivery and collection, piping, pumps, valves, meters and related hydraulic units. Emphasis will be on system design, installation, operation, maintenance and safety considerations.

Grade Modes: Letter Graded

Degree Applicability: Applies to Associate Degree

AA/AS GE: None

Transfer Credit: None

WS V11 Water Treatment 3 Units

In-Class Hours: 52.5 lecture

This course is a study of water treatment and supply. Subjects to be studied will include the historical development of water quality control, water sources, public health, water chemistry, bacteriology, chemical treatment, water filtration methods, softening, corrosion, taste and odors, and basic delivery systems.

Grade Modes: Letter Graded

Degree Applicability: Applies to Associate Degree

AA/AS GE: None

Transfer Credit: None

WS V12 Wastewater Treatment 3 Units

In-Class Hours: 52.5 lecture

This course is a study of commonly used wastewater treatment processes. Subjects to be studied will include the principles of physical, chemical and biological wastewater treatments such as sedimentation, biofiltration, activated sludge, sludge digestion and chlorination. This course will also include the calculations necessary to control the processes.

Grade Modes: Letter Graded

Degree Applicability: Applies to Associate Degree

AA/AS GE: None

Transfer Credit: None

WS V13 Wastewater Collection 3 Units

In-Class Hours: 52.5 lecture

Advisories/Rec Prep: WS V10 or equivalent

This course is a study of wastewater collection systems. It is intended for system designers, supervisors and maintenance personnel. Subjects to be studied will include sewer design and construction, pumping stations, treatment plant operations, system cleaning methods, construction safety, elementary hydraulics, pipeline and manhole repair, equipment maintenance, public relations, organizational communication and record keeping.

Grade Modes: Letter Graded

Degree Applicability: Applies to Associate Degree

AA/AS GE: None

Transfer Credit: None

WS V14 Water Distribution 3 Units

In-Class Hours: 52.5 lecture

This course is a study of water distribution systems. Subjects to be studied will include water production, water storage, types of reservoirs, system design, construction methods, water lines, pumping stations and other components. Included in this course will be the installation and repair of such facilities, and the administrative functions behind the water distribution system.

Grade Modes: Letter Graded

Degree Applicability: Applies to Associate Degree

AA/AS GE: None

Transfer Credit: None

WS V15 Water Systems Instrumentation and Controls 3 Units

In-Class Hours: 52.5 lecture

This course provides an introduction to the principles and operation of instrumentation and control devices related to water and wastewater systems. Subjects to be covered will include open and closed channel flow measurement, differential pressure measurement, level transmitters, data transmission and recording devices, and electrical control circuits. Basic electrical control theory is provided to the extent necessary for understanding principles of operation.

Grade Modes: Letter Graded

Degree Applicability: Applies to Associate Degree

AA/AS GE: None

Transfer Credit: None

WS V16 Water Quality Protection and Cross-Section Control 3 Units

In-Class Hours: 52.5 lecture

Advisories/Rec Prep: WS V10 or equivalent

This course is an introduction to cross-connection control, cross-connection control hazards and backflow prevention devices. Subjects to be studied will include equipment installation, testing, maintenance and regulations regarding water quality safety. This course will also cover backflow certification.

Grade Modes: Letter Graded, Student Option- Letter/Credit, Pass/No Pass Grading

Degree Applicability: Applies to Associate Degree

AA/AS GE: None

Transfer Credit: None

WS V17 Water and Wastewater Hydraulics 3 Units*In-Class Hours:* 52.5 lecture*Advisories/Rec Prep:* WS V10 or equivalent

This course is a study of the hydraulics necessary in the operation of water or wastewater plants and systems. Subjects to be covered will include open channel and closed channel flow, metering devices, valve design and functions and the hydraulics of common control systems. The course will be oriented to the hydraulic problems most often encountered in operational experience.

Grade Modes: Letter Graded, Student Option- Letter/Credit, Pass/No Pass Grading**Degree Applicability:** Applies to Associate Degree**AA/AS GE:** None**Transfer Credit:** None**WS V18 Motors and Pumps Maintenance and Operation 3 Units***In-Class Hours:* 52.5 lecture*Advisories/Rec Prep:* WS V10 or equivalent

This course is designed to give a working knowledge of the problems encountered in motors and pumps operation and maintenance. The course will provide the maintenance mechanic with insight into reasons for selection as well as causes of failure and breakdown of motors and pumps. The need for a thorough maintenance program will be explained. All types of pumps and pump curves will be covered.

Grade Modes: Letter Graded, Student Option- Letter/Credit, Pass/No Pass Grading**Degree Applicability:** Applies to Associate Degree**AA/AS GE:** None**Transfer Credit:** None**WS V19 Advanced Water Treatment 3 Units***In-Class Hours:* 52.5 lecture*Advisories/Rec Prep:* WS V11

This course is a study in advanced potable water treatment processes. Subjects to be covered will include conventional water treatment, fluoridation, corrosion and scaling stabilization, iron and manganese control, lime and ion exchange softening, adsorption, aeration, and membrane processes.

Grade Modes: Letter Graded, Student Option- Letter/Credit, Pass/No Pass Grading**Degree Applicability:** Applies to Associate Degree**AA/AS GE:** None**Transfer Credit:** None**WS V20 Water System Mathematics 3 Units***In-Class Hours:* 52.5 lecture

Introduces basic mathematical principles related to water and wastewater industry systems. Subjects included are area, volume, pressures, flow rates, unit conversion, chemical dosages, detention time and filtration rates. This course will assist in the preparation for six different state certification exams: water treatment, water distribution, wastewater collection, wastewater treatment, qualified stormwater practitioner, and qualified stormwater developer.

Grade Modes: Letter Graded, Student Option- Letter/Credit, Pass/No Pass Grading**Degree Applicability:** Applies to Associate Degree**AA/AS GE:** None**Transfer Credit:** None**WS V21 Water Chemistry and Bacteriology 4 Units***In-Class Hours:* 52.5 lecture, 52.5 laboratory*Advisories/Rec Prep:* WS V11 or WS V12

This course covers the elements of water chemistry and water bacteriology as they apply to water treatment processes, water conditioning and the protection of water quality. The course includes laboratory demonstrations in the techniques of physical, chemical and bacteriological examination of water.

Grade Modes: Letter Graded, Student Option- Letter/Credit, Pass/No Pass Grading**Degree Applicability:** Applies to Associate Degree**AA/AS GE:** None**Transfer Credit:** None**WS V22 Stormwater Pollution Prevention 3 Units***In-Class Hours:* 52.5 lecture

This course is based upon the California Stormwater Quality Association's (CASQA) Best Management Practice Handbooks. Course content focuses on management of pollutants in stormwater runoff. It also introduces National Pollutant Discharge Elimination System (NPDES) laws and regulations. It serves as both the initial training and as Continuing Education Units (CEUs) for Professional Engineers, Municipal Employees, Construction Managers, and Regulatory Agencies.

Grade Modes: Letter Graded**Degree Applicability:** Applies to Associate Degree**AA/AS GE:** None**Transfer Credit:** None**WS V25 Water and Wastewater Management 3 Units***In-Class Hours:* 52.5 lecture*Advisories/Rec Prep:* WS V10

This course is a study of the supervisor's administrative responsibilities managing public utilities. Subjects to be covered will include organizational budgets, project budgets, project scheduling, human resources, providing workforce training, management/labor relations, coordinating and evaluating workers, worker grievances, industrial safety, and other workplace responsibilities.

Grade Modes: Letter Graded**Degree Applicability:** Applies to Associate Degree**AA/AS GE:** None**Transfer Credit:** None**WS V95 Water Science Internship I 1-4 Units***In-Class Hours:* 60-240 unpaid cooperative*Corequisites:* Enrolled in a minimum of 7 units to include internship*Advisories/Rec Prep:* Completion of or concurrent enrollment in one course in the discipline

This course offers students who are volunteers (unpaid) an opportunity to obtain work experience related to their field of study. Students are accepted as a result of consultation with a designate faculty member in the discipline and the acceptance of an approved work proposal.

Grade Modes: Pass/No Pass Grading**Field Trips:** Will be required**Degree Applicability:** Applies to Associate Degree**AA/AS GE:** None**Transfer Credit:** None

WS V96 Water Science Internship II 1-4 Units

Corequisites: enrolled in a minimum of 7 units to include internship

Advisories/Rec Prep: completion of or concurrent enrollment in one course in the discipline. Offered on a pass/no pass basis only

This course offers students who are employed in the field an opportunity to expand their work experience related to their field of study. Students are accepted as a result of consultation with a designated faculty member in the discipline and the acceptance of an approved work proposal.

Grade Modes: Pass/No Pass Grading

Field Trips: Will be required

Degree Applicability: Applies to Associate Degree

AA/AS GE: None

Transfer Credit: None

- Water Science, Associate in Science (<http://catalog.vcccd.edu/ventura/programs-courses/water-science/water-science-as/>)
- Water Science, Certificate of Achievement (<http://catalog.vcccd.edu/ventura/programs-courses/water-science/water-science-coa/>)