

WATER/WASTEWATER TECHNOLOGY (WWTR)

101 FUNDAMENTALS OF WATER/WASTEWATER TECHNOLOGY 3 UNITS

3 hours lecture

This course provides a broad overview of the water and wastewater fields and issues confronting the industry. Students will learn how source waters are obtained, treated, and distributed and how wastewater is collected, transported, and disposed of in the area. Contemporary issues facing the water and wastewater industry will be explored.

CSU

102 CALCULATIONS IN WATER/WASTEWATER TECHNOLOGY 3 UNITS

Recommended Preparation: Grade of "Pass" in MATH 090 or equivalent

3 hours lecture

Study of the mathematical principles and methods involved in solving problems related to water and wastewater treatment, distribution, and collection systems, including volume, flow rate, velocity, pressure, force, unit conversions, dimensional analysis, chemical dose rates, dilutions, filter loading and backwash rates as related to water/wastewater technology.

CSU

103 INTRODUCTION TO WATER RESOURCES MANAGEMENT 3 UNITS

3 hours lecture

With the ever increasing demands for safe and reliable supplies of potable water, combined with decreasing supplies and over commitments of our existing water resources, we are facing a serious water crisis in the western United States. This course explores the history and development of California water resources, legal and financial issues, water portfolio diversification, the role of groundwater recharge and management, wastewater reclamation and reuse, desalination, and energy conservation.

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104 APPLIED HYDRAULICS 3 UNITS

Recommended Preparation: "C" grade or higher or "Pass" in WWTR 102 or equivalent

3 hours lecture

Study of the hydraulic principles involved in the operation of water and wastewater distribution and collection systems. The behavior of water in closed-conduit pressure systems and open channel delivery systems and the types of pumps used in water/wastewater service and their operational characteristics will be explored.

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105 PRINCIPLES AND PRACTICES OF WATER CONSERVATION 3 UNITS

3 hours lecture

This course provides theoretical and practical training in applied water use efficiency and a foundation in the need for and major components of comprehensive water conservation programs. Topics include residential, commercial, and landscape customers; water uses; budgets; demand management; water audits; Best Management Practices; rate structures; and program design and management.

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106 INTRODUCTION TO ELECTRICAL AND INSTRUMENTATION PROCESSES 3 UNITS

3 hours lecture

An introductory course in basic electronic, electrical, and control system principles. Electrical safety precautions, component identification, schematic interpretation, motors, transformers, relays and test equipment will be studied. Automated process control devices and an overview of current technologies will be discussed.

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110 LABORATORY ANALYSIS FOR WATER/WASTEWATER 3 UNITS

3 hours lecture

Examines basic fundamentals of laboratory analysis with an emphasis on applied chemical and microbiological procedures for water and wastewater plant operators. Includes procedures and techniques used in physical, chemical, bacteriological and biological examination of water/wastewater.

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112 BASIC PLANT OPERATIONS: WATER TREATMENT 3 UNITS

Recommended Preparation: "C" grade or higher or "Pass" in WWTR 102 or equivalent

3 hours lecture

Study of the sources of water and the public health aspects of water supply; chemical, physical and bacteriological standards of water quality; types of water treatment plants; and water treatment procedures, operation, maintenance, storage and distribution.

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114 BASIC PLANT OPERATIONS: WASTEWATER TREATMENT 3 UNITS

3 hours lecture

An introduction to the basic principles involved in the operation of conventional public wastewater treatment plants. Provides information on plant hydraulics, preliminary, primary and secondary treatment processes, disinfection, as well as environmental and safety regulation compliance.

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115 WASTEWATER RECLAMATION AND REUSE 3 UNITS

3 hours lecture

This course covers the fundamentals of wastewater reclamation and reuse. Topics include the history of wastewater treatment and reclamation; total resource recovery including bio-solids/biogas harvesting; planning, design, and construction of reclamation plants; and reclaimed wastewater distribution. Problems regarding regulations, marketing, and public perception of using reclaimed wastewater will be discussed, along with public safety issues.

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117 ADVANCED PLANT OPERATIONS: WATER TREATMENT 3 UNITS

Prerequisite: "C" grade or higher or "Pass" in WWTR 112 or equivalent

3 hours lecture

The study of water quality control and treatment. Aspects of public health as it relates to the water supply will be highlighted. Sources of contamination and methods of control will be emphasized as well as maintenance of water treatment facilities, safety, cost, and environmental factors.

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120 ADVANCED PLANT OPERATIONS: WASTEWATER TREATMENT 3 UNITS

Prerequisite: "C" grade or higher or "Pass" in WWTR 114 or equivalent

3 hours lecture

This course examines how modern wastewater treatment plants are operated to maximize efficiency and reliability in processing municipal wastewater. Emphasis on wastewater treatment plant facilities, equipment, preventative maintenance procedures, plant process monitoring and control, and safety/regulatory compliance.

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130 WATER DISTRIBUTION SYSTEMS 3 UNITS

Recommended Preparation: "C" grade or higher or "Pass" in WWTR 102 or equivalent

3 hours lecture

Study of the operation and maintenance of a water supply and distribution system. Water sources, water quality, treatment methods, distribution operations, customer metering, pipeline installation and repair, valves and appurtenances, storage tanks, and maintenance topics will be discussed. Includes mathematical and hydraulic formulas and principles to determine volume, flow, pressure and force. Part of a series required for eligibility to take the California Department of Public Health (CDPH) Water Distribution Operator certification examinations; supports certification examinations for CDPH Water Distribution Operator grade D1 and D2.

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132 WASTEWATER COLLECTION SYSTEMS 3 UNITS

3 hours lecture

Study of the components of wastewater collection systems. Overview of design installation, operation, monitoring, maintenance and repair of sewer pipelines, pump stations and related facilities.

CSU

134 MECHANICAL MAINTENANCE 3 UNITS

3 hours lecture

Overview of the basic principles of mechanical equipment design, installation, operation, maintenance, repair, overhaul and replacement. Emphasis on understanding the value of preventative maintenance techniques such as equipment monitoring, lubrication analysis, machine alignment and scheduled overhaul.

CSU

265 WATER DISTRIBUTION SYSTEMS II 3 UNITS

Prerequisite: "C" grade or higher or "Pass" in WWTR 130 or equivalent

3 hours lecture

The second of an integrated sequence of courses covering water distribution systems. Students will gain a more comprehensive understanding of the operation and maintenance of a water supply and distribution system including advanced calculations, management, safety, and emergency response issues. Contemporary issues facing the water and wastewater industry will be explored in depth. Expands on topics covered in the introductory course, WWTR 130. Part of a series required for eligibility to take the California Department of Public Health (CDPH) Water Distribution Operator certification examinations; prepares students to take and pass CDPH Water Distribution Operator certification examinations for grades D3, D4 and D5

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267 WASTEWATER COLLECTION SYSTEMS II**3 UNITS**

Prerequisite: "C" grade or higher or "Pass" in WWTR 132 or equivalent

3 hours lecture

Provides an in-depth understanding of the operation and maintenance of wastewater collection systems. Includes the design, operation, monitoring, maintenance and repair of collection systems and pump stations; equipment maintenance; safety and survival systems; and administration and organizational principles.

CSU

268 INTRODUCTION TO MEMBRANE PLANT OPERATION**3 UNITS**

Prerequisite: "C" grade or higher or "Pass" in WWTR 112 or 114 or equivalent

3 hours lecture

Study of basic membrane technology and the application of this technology to water and wastewater treatment. This course explores the operation and maintenance of membrane components within a water and wastewater treatment system, as well as pre and post treatment.

CSU

270 PUBLIC WORKS SUPERVISION**3 UNITS**

Prerequisite: "C" grade or higher or "Pass" in WWTR 101 or equivalent

3 hours lecture

Introduction to the principles and practices of modern supervision and management with an emphasis on contemporary issues facing supervisors and managers in the water utilities industry.

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280 BACKFLOW TESTER TRAINING**2 UNITS**

1.5 hours lecture, 1.5 hours laboratory

Preparation for the American Water Works Association (AWWA) and the American Backflow Prevention Association (ABPA) certification for Backflow Prevention Assembly Tester Certification. Includes backflow device installation and testing procedures required for the certification testing.

CSU

282 CROSS CONNECTION CONTROL SPECIALIST**3 UNITS**

3 hours lecture

Study of the administrative and technical procedures required for a cross connection program, including system inspections, hazard evaluation, identification of cross connection problems and backflow prevention devices, shut-down tests, and reclaimed water systems.

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284 CROSS CONNECTION CONTROL SPECIALIST-RECYCLED WATER**3 UNITS**

3 hours lecture

Study of the administrative and technical procedures concerning the production, use and distribution of recycled water including backflow protection, legal, administrative and permitting issues, the treatment process, health and safety aspects, and the cross connection control (shut down) test as conducted in San Diego County. Various aspects of cross connection control recycled water shut down testing will be demonstrated.

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290 COOPERATIVE WORK EXPERIENCE**1-4 UNITS**

Recommended Preparation: Successful completion of at least three Water/Wastewater Technology courses prior to enrolling in WWTR 290 is highly recommended

5 hours paid or 4 hours unpaid work experience per week per unit

Practical application of principles and procedures learned in the classroom to the various phases of water and wastewater treatment, distribution or collection. Work experience will be paid or unpaid at appropriate curriculum-related work sites. Two on-campus sessions will be scheduled. *May be taken for a maximum of 12 units.*