
Water Technology Program Review



2005-2006

Citrus College

Program Review Team:

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FULL TIME FACULTY: None

ADJUNCT FACULTY: James Glancy
David DeJesus
Steve Sherman

ADVISORY COMMITTEE: Duffy Atkinson, Civil Engineer
Frank Baumann, Water Consultant
Edward Butikofer, San Gabriel Valley Water Company
David DeJesus, Covina Irrigating Company
James Foote, Southwest Water Company
James Glancy, City of Lakewood
Michael Keith, L.A. County Dept. of Public Works
Joan Oppenheimer, Montgomery-Watson-Harza
Steve Patton, City of Glendora
Steve Sherman, Covina Irrigating Company
Del Quevedo, L.A. County Dept. of Public Works
Martin Ray, City of Arcadia
Diane Rentfrow, Golden State Water Company
Gary Williams, Golden State Water Company

I. MISSION

PROGRAM DESCRIPTION

This program is designed to prepare students who wish to seek entry level employment in the public water supply industry or qualify for a more responsible position within the industry. These courses will be helpful to students who wish to prepare for the T1, T2, T3, T4 and T5 Water Treatment Operator and D1, D2, D3, D4, and D5 Water Distribution Operator certification examinations given by the Department of Health Services. The Citrus College Water Technology program is approved by the Department of Health Services as a provider of Specialized Training for operator certification requirements as well as for Contact Hours for operator certificate renewal.

OBJECTIVES:

1. The program prepares the student to enter the field of water technology with knowledge and skills in treatment and distribution of the public water supply.

2. The program prepares students to qualify for D1, D2, D3, D4 and D5 Distribution Operator's certification and for T1, T2, T3, T4, and T5 Treatment Operator's certification.
3. The program prepares students who are currently employed in the water industry with upgraded skills for advancement.

DEGREE OFFERED: Associate in Science, Applied Arts

CERTIFICATE OFFERED: Water Technology Certificate

CERTIFICATES ISSUED:

2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
2	2	1	3	2

CONTACT HOURS AWARDED:

	2003	2004	2005
Number of Students	205	360	210
Number of Hours	615	1080	630

SEQUENCE OF COURSES
FOR WATER CERTIFICATE:

Required

WATR 150 Introduction to Water Systems
 WATR 151 Water Resources and Distribution
 WATR 156 Water Treatment I
 WATR 153 Water Resources and Distribution II
 Or
 WATR 157 Water Treatment II
 MATH 115 Business Mathematics
 Or
 Any Higher Level Mathematics

Plus One of the Following

BUS 151 Business Spelling and Vocabulary
 BUS 152 Business Communications
 CSIS 100 Introduction to Computers
 CSIS 130 Microcomputer Applications I
 PUB 155 Public Works Inspection

PUB 160 Public Works Administration
PUB 161 California Occupational Safety & Health
SPCH 101 Public Address
SPCH 106 Small Group Communication

COMMENDATIONS:

- The Water Technology Program is consistent with the Citrus College Mission Statement.
- This program offers an occupational Certificate and a degree to prepare students for a career in the water industry.
- Citrus College was among the three colleges who began the first Water Technology programs in California in 1970.
- Contact Hours are available from Citrus College for students who need to obtain or renew their water treatment or distribution operator certification through the Department of Health Services.
- A consistent rotation of classes has been offered in this small and highly specialized program so that student access to Certificate classes is assured.
- The Water Technology Advisory Council awards two scholarships annually to Citrus College students from the proceeds of Water Awareness Day.
- Water Technology faculty have incorporated technology into the curriculum including the use of a self-paced math program in the computer lab and Powerpoint presentations in the classroom.

PROGRESS TOWARD PREVIOUS RECOMMENDATIONS:

- From 1999: Integrate Water Technology with appropriate transfer coursework such as Chemistry, Math, Public Works, and Architecture.
The Water Technology Certificate in 2005 includes one required Math class and electives in Business, Computer Science and Information Systems, Public Works, and Speech.

RECOMMENDATIONS:

- By headcount, there are less than 100 Water Technology students enrolled at Citrus College at any given time, most taking one class per semester. A portion of these students are working toward their Water Technology Certificate, and others are taking coursework specifically for their operator certification. Six classes are required for the Water Technology Certificate. The Certificate is reviewed annually by the Water Technology Advisory Council for relevancy to industry standards. It would therefore be expected that up to 10 Certificates

would be awarded each year. Certificate awards range from 1-3 in this program annually. It is recommended that staff redouble their efforts to encourage eligible students to apply for their certificate, especially students who are completing WATR 153 Water Resources and Distribution II and WATR 157 Water Treatment II.

- Though employees in the water industry are overwhelmingly male, it is recommended that a concerted effort be put forth to attract female students into the program.

II. NEED

SIMILAR PROGRAMS
AT OTHER COLLEGES:

See Inventory of Approved Programs by TOP Code attached

LABOR MARKET INFORMATION:

From Employment Development Department website
<http://www.labormarketinfo.edd.ca.gov>

Water & Liquid Waste Treatment Plant & System Operator In Los Angeles County

Operate or control an entire process or system of machines, often through the use of control boards, to transfer or treat water or liquid waste

Occupational Wages

Area	Year Period	Hourly Mean	Hourly Entry Level	Hourly Experience Level
Los Angeles - Long Beach PMSA	2005 3rd Qtr	\$26.65	\$19.65	\$30.16

Data for Los Angeles County is not available. Data for Los Angeles - Long Beach PMSA has been displayed for Occupational Wages.

Occupational Projections of Employment (also called "Outlook" or "Demand")

Area	Estimated Year-Projected Year	Employment	Employment Change	Annual Avg Openings
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		Estimated	Projected	Number	Percent	
Los Angeles County	2002 - 2012	1,820	2,070	250	13.7	88
License Title	License Authority					
Water Treatment Operator Certification	Department of Health Services, Water Treatment Operator Program P.O. Box 942732 Sacramento, CA 94234-7320					

COMMENDATIONS:

- The Water Technology Program has a strong and positive reputation for serving the needs of the public water supply industry.
- The Citrus College Water Technology program is approved by the Department of Health Services as a provider of Specialized Training for operator certification requirements as well as for Contact Hours for operator certificate renewal.
- Enrollment has increased steadily by all measures in the past five years: registration is up by 73%, weekly student contact hours are up by 89%, and full-time equivalent students are up by 89%.
- Class fill rates, based on a seat maximum of 48, have more than doubled: from 43% in 2000-01 to 88% in 2004-05.
- The annual Water Awareness Day attracts 250 water professionals to Citrus College to hear industry speakers and receive Department of Health contact hours toward operator certification.
- Citrus College has awarded 2325 contact hours to 775 students for their Department of Health Services Operator certification over the past three years.
- When the Cross Connection Control/Backflow Prevention class was unable to reach minimum enrollment, Citrus College offered this class through Contract Education to meet community and industry need.
- The Water Technology Program is helping the industry to prepare for the replacement of a significant number of managers and supervisors who will retire in the next five to ten years.
- Water agency job fliers and promotion opportunity notices are made available to Citrus College students in the Water Technology classes.
- A Citrus College Water Technology grant application is being submitted to the Metropolitan Water District to support the creation, recruitment, and implementation of a distance education course entitled "Updates in the Water Industry." This one-unit class will address the needs of water operators to obtain contact hours every three years to renew their certification.

PROGRESS TOWARD PREVIOUS RECOMMENDATIONS:

- From 1999: Continue to promote the Water Technology Program and employer incentives to the industry.
- From 1999: Enrollment has declined in this program over the past several years; increased marketing to potential students may help increase enrollment.

Five new employers have been added to the Water Technology Advisory Council since 2002. Class fliers are distributed through the Advisory Council as well as through Water Technology faculty and students. The annual Water Awareness Day has been another opportunity to promote the program at Citrus College.

- From 1999: Offer Water Technology via distance education.
Distance Education continues to be a topic of conversation. Obstacles include the lack of full-time faculty in this program and a perceived reluctance to take this mode of course by the target population.

- From 1999: The Water Technology Program needs to increase enrollment of female students.
Women continue to be underrepresented in the Water Technology program. Fewer than 3% of Water Technology students and Water Awareness Day participants are female. A female instructor for the Water Treatment classes provided role modeling for two years, but no females are on the faculty at this time. The student population at Citrus College reflects the gender imbalance in the industry.

RECOMMENDATIONS:

- The ratio of full-time equivalent student to full-time equivalent faculty has gone from 19:1 in 2000-01 to 42:1 in 2004-05. It is recommended that alternatives to the large class size for the introductory course be explored such as a second section or an on-line class.
- It is recommended that alternate delivery modes be explored to meet industry needs such as contract education or seminar style workshops of six hours at water agency locations to facilitate the award of Contact Hours.
- Though employees in the water industry are overwhelmingly male, it is recommended that a concerted effort be put forth to attract female students into the program.

III. QUALITY

COMMENDATIONS:

- The Citrus College Water Technology program is a leader in presenting water issues to the public.

- Annual revenue based on full-time equivalent students for the Water Technology Program has risen 105% in the past five years.
- This program continues to be served exclusively by adjunct professors who are water professionals, working in the field, bringing currency to the classroom every week.
- Program productivity numbers have raised steadily over the past five years, increasing from 574 to 1265, a gain of 120%.
- Coursework and Certificate requirements are kept current and aligned with industry standards through regular review by the Citrus College Water Technology Advisory Council.
- Student Learning Outcomes were created for every Water Technology class. This was accomplished by the adjunct faculty working on their own time with the Director.
- The Water Technology Advisory Council leads an aggressive outreach program to professionals and the community, including 20 years of the annual event, Water Awareness Day at Citrus College.
- Adjunct faculty and Water Technology Advisory Council members have volunteered their time to plan and host the Citrus College Water Awareness Day every spring for 20 years.

PROGRESS TOWARD PREVIOUS RECOMMENDATIONS:

- From 1999: Courses required for the Water Technology Certificate should be available to students in a reasonable time span.
Water Technology classes are carefully rotated to provide access to Certificate classes to students in a timely manner. This rotation also takes into account the specialized nature of the program and the small target population.

RECOMMENDATIONS:

- It is recommended that the proposed distance education class “Updates in the Water Industry” be offered, after approval, on a regular schedule to meet the needs of students who need to obtain Contact Hours and renew their operator certification.
- Syllabi will be revised for the fall 2006 semester to reflect the recently approved Student Learning Outcomes.

IV. FEASIBILITY

COMMENDATIONS:

- The Water Technology program has very low overhead for a vocational program.

- Cost per full-time equivalent student has decreased from \$1575 in 2000-2001 to only \$838 in 2004-2005. Not including inflation adjustment, this is a savings of 47%.

PROGRESS TOWARD PREVIOUS RECOMMENDATIONS:

- From 1999: The Water Technology Program would benefit from consistent and appropriate classroom space.
The introductory class has been offered in the same location for several years. Appropriate lecture space is fairly consistent for other classes.

V. COMPLIANCE WITH REGULATIONS, LICENSES, STANDARDS

COMMENDATIONS:

- Citrus College has been approved by the Department of Health Services to award the contact hours required for water industry operator certification.
- The Citrus College Water Technology program is approved by the Department of Health Services as a provider of Specialized Training for operator certification requirements as well as for Contact Hours for operator certificate renewal.

PROGRESS TOWARD PREVIOUS RECOMMENDATIONS:

- From 1999: The Water Technology Advisory Committee will continue to provide regular updates on regulations, licenses, and industry standards.
Updates are ongoing on regulations, operator certification, and industry standards.