

WATER TECHNOLOGY

EPA State Environmental Training Program

Associate of Water Technology Degree

Certificate of Completion

The Water Technology program is an award-winning, up-to-date technical training opportunity that will open doors to a career anywhere in the United States. Graduates of this program have found work in New Mexico, Colorado, Texas, Arizona, California, Vermont, New Hampshire, Iraq, and Puerto Rico. More than 400 graduates have begun careers in the water field, working in such diverse areas as the semiconductor industry, the food processing industry, aerospace industry, electrical power industry, city water and wastewater departments, municipal or contract analytical laboratories, water reuse or recycling plants, metal plating companies, engineering consulting firms, and state planning offices.

While jobs are widely available, training programs like this one are rare. As the treatment of water becomes more technical, municipalities and industries rely on training programs to fill their needs. Students in this program learn how to clean water to make it safe for drinking and how to purify water to a high quality for use in computer chip manufacturing, food processing, or steam generation. They will also learn how to treat wastewater so it can be safely returned to the environment or reclaimed for beneficial use. Instruction also includes maintaining equipment such as pumps, motors, valves, and chemical feeders; laboratory testing and analysis; water and wastewater chemistry and microbiology; applied math; and some basics of supervising and managing a water utility, including budgets, preventive maintenance schemes, and billing. Various course assignments requiring laboratory data sheets, simple process control spreadsheets, and term papers enable students to sharpen their computer and writing skills. General studies in basic algebra, speech, and technical writing round out the curriculum.

Whether taking classes or working on a job site, students enrolled in this program will be required to perform the same job duties and be able to meet the same physical requirements that they will as graduates in the field. Depending where they find employment, graduates may be required to

- work in inclement weather,
- lift up to 50 pounds from the ground,
- work safely around hazardous chemicals using appropriate safety equipment such as a self-contained breathing apparatus,
- work safely in confined spaces,
- ascend and descend stairs and ladders to reach equipment,
- work safely around heavy equipment,
- work safely and effectively on uneven surfaces, and
- stand for long periods of time on concrete floors.

Some positions in the field require certification and the licensing agency may not provide special testing accommodations.

Opportunities for students to gain new knowledge and skills in operations, maintenance, and laboratory areas are provided through

classroom training, hands-on laboratories, field trips, guest lectures, and training on the program's own water and wastewater plants.

Before graduating, students will spend a minimum of 180 hours at an internship site with a municipality or industry. Students have found co-ops at water and wastewater plants and laboratories in Albuquerque, El Paso, Las Cruces, Socorro, Hobbs, Silver City, Mesilla, and Glorieta, and with industries such as Intel and Kurita America.

Financial aid beyond loans, grants, work-study monies, and DACC scholarships include nine private scholarships specifically for Water Technology students:

1. Max Summerlot Memorial Scholarship, given to a water technology student in his or her second year in the program;
2. Cynthia Hiers-Robinson Current-Use Scholarship;
3. Pruett Family Water Technology Scholarship;
4. Col. Raymond Madson Memorial Scholarship
5. two scholarships presented by the New Mexico Water and Wastewater Association;
6. one scholarships presented by the Southwest Section of the New Mexico Water and Wastewater Association; and
7. two scholarships presented by the Central Section of the New Mexico Water and Wastewater Association.

NOTE: Students must achieve a cumulative grade-point average of 2.0 with a final grade of C- or better in ENGL 1110G Composition I and a final grade of C- or better in all required WATR courses. The remaining courses are applicable toward the bachelor of applied studies degree offered by the NMSU College of Extended Learning. At least 36 hours of the technical requirements are applicable toward the bachelor's degree in agricultural and extension education offered by the College of Agricultural, Consumer and Environmental Sciences at New Mexico State University.

Water Technology - Associate of Water Technology (<https://catalogs.nmsu.edu/dona-ana/academic-career-programs/water-technology/water-technology-aas/>)

Water Technology - Certificate of Completion (<https://catalogs.nmsu.edu/dona-ana/academic-career-programs/water-technology/water-technology-certificate-completion/>)

WATR 120. Introduction to Water Systems

3 Credits (3)

Introduction to and theory of groundwater sources, production, treatment, and distribution.

WATR 130. Wastewater Collection and Basic Treatment Systems

3 Credits (3)

Introduction to wastewater characteristics, collection, and basic treatment operations.

WATR 140. Applied Water and Wastewater Math I

3 Credits (3)

Introduction to basic water and wastewater mathematics, flows through distribution networks and collection systems, and fundamentals of flow measurement.

Prerequisite: CCDM 114 N or equivalent.

WATR 160. Systems Maintenance

4 Credits (2+4P)

Basic tools, equipment, maintenance schedules, chlorinator troubleshooting, and chlorine safety. Hands-on training with valves, pumps, meters and chlorination equipment.

WATR 175. Programmable Logic Controllers
2 Credits (2)

This course will introduce students to electrical safety, theory, and the function, operations, programming and troubleshooting of the PLC controlling common electrical components utilized in control circuits associated with the water and wastewater industry. Restricted to: Community Colleges only.

WATR 180. Water Chemistry
3 Credits (3)

Basic chemistry with applications to water and wastewater analysis.
Prerequisite: CCDM 114 N or consent of instructor.

WATR 182. Water Chemistry Analysis
1 Credit (3P)

Beginning water and wastewater laboratory analysis including gravimetric, volumetric, and quality control techniques.
Prerequisite: CCDM 114 N or equivalent or consent of instructor.

WATR 190. Water and Wastewater Microbiology
3 Credits (3)

Overview of microorganisms associated with water and wastewater. Growth and reproduction, energy production, and methods of counting.
Prerequisite: WATR 130, WATR 180, or consent of instructor.

WATR 192. Water and Wastewater Microbiological Analysis
1 Credit (3P)

Introduction to water and wastewater treatment operational tests such as BODs, solids testing, activated sludge control tests, use of microscope, and bacteriological techniques.
Prerequisites: WATR 130 and WATR 182, or consent of instructor.

WATR 200. Internship
3-5 Credits

On-the-job training/work experience with municipalities or industries, working in water or wastewater treatment plants, high purity water plants, industrial waste plants, distribution systems, or wastewater collection systems. May be repeated up to 5 credits. Consent of Instructor required. Restricted to: Water Technology majors. Graded: S/U Grading (S/U, Audit). Restricted to Community Colleges campuses only.

WATR 220. Water Treatment Systems
3 Credits (3)

Theory of water systems operation including surface water treatment, fluoridation, sodium zeolite softening, corrosion control, iron removal, various filtration methods, and overview of SDWA.
Prerequisites: WATR 180 and WATR 182 or consent of instructor.

WATR 222. Water Systems Operation
1 Credit (3P)

Operations of various water treatment systems including surface water treatment, sodium zeolite softeners, and various filtration methods.
Prerequisite: WATR 220 or consent of instructor.

WATR 230. Advanced Wastewater Treatment
4 Credits (4)

Calculations and operations involved in wastewater and water reclamation plants.
Prerequisites: WATR 140, WATR 190, and WATR 192, or consent of instructor.

WATR 232. Wastewater Systems Operations
1 Credit (3P)

Operation of pretreatment, primary, and biological treatment units.

Prerequisite: WATR 230 or consent of instructor.

WATR 240. Advanced Water and Wastewater Math II
3 Credits (2+2P)

Advanced water and wastewater mathematics. Flow measurement. Systems head and pump curves.
Prerequisites: WATR 140.

WATR 250. Municipal Systems Management
4 Credits (4)

Management of water utility systems including laws, finance, records, and safety.
Prerequisites: WATR 120, WATR 130.

WATR 270. Special Topics
1-4 Credits

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

WATR 275. Certification Review
3 Credits (3)

Review of water and wastewater plant operations and laws in preparation for state certification exams. Restricted to Community Colleges campuses only.

Prerequisite: WATR 120, WATR 130, WATR 140, WATR 160.

Learning Outcomes

1. Identify appropriate process changes for different wastewater processes.
2. Identify appropriate process changes for different water processes.
3. Identify corrective actions for equipment failure.
4. Identify analytical data required to complete process control calculations.
5. Accurately complete water process control calculations.
6. Accurately complete wastewater process control calculations.
7. Evaluate operational problems.
8. Identify the sampling points for data collection.

WATR 285. High Purity Water Treatment Systems
3 Credits (3)

Principles of high purity water production including microfiltration, ultrafiltration, reverse osmosis, and deionization.

Prerequisite: WATR 220.

WATR 287. Advanced Water Chemistry Analysis
3 Credits (6P)

Sampling techniques, analysis, and evaluation of potable water contaminants using gravimetric, volumetric, spectrophotometric, and other instrumentation methods.

Prerequisite/Corequisite: WATR 285. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Evaluate invalid labs analysis to determine corrective actions.
2. Identify information/data required to complete calculations.
3. Accurately perform calculations.
4. Demonstrate correct/accurate laboratory technique.
5. Demonstrate correct/accurate laboratory technique.
6. Perform operational/laboratory duties safely.

WATR 290. Advanced Wastewater Microbiology and Chemistry
3 Credits (3)

Covers NPDES permits and DMR calculations and reporting; 503 sludge regs, including pathogen and vector attraction reduction and pollutants; wetlands, composting, and wastewater treatment ponds microbiology;

activated sludge bulking and foaming microbiology and treatment; and use of selector to remove nutrients and prevent the growth of filamentous bacteria.

Prerequisite: WATR 190, WATR 192.

WATR 292. Advanced Wastewater Analysis

3 Credits (6P)

Covers sampling techniques, analysis, and evaluation of wastewater contaminants using gravimetric, volumetric, spectrophotometric, and other instrumentation methods.

Prerequisite: WATR 190 and WATR 192.

Name: Travis Hawkins, Interim Department Chair

Office Location: DATS 155A

Phone: (575) 527-7584

Email: THawkins@dacc.nmsu.edu (TMount@dacc.nmsu.edu)

Name: Megan Hernandez-Smith, Advanced Technologies Academic Advisor

Office Location: DATS 155C

Phone: (575) 528-7242

Email: mehernandez@dacc.nmsu.edu

Name: Karina Diven, Advanced Technologies Administrative Assistant

Office Location: DATS 155

Phone: (575) 527-7590

Email: KDiven@dacc.nmsu.edu

Website:<https://dacc.nmsu.edu/academics/programs/water-technology/index.html> (<https://dacc.nmsu.edu/academics/programs/water-technology/>)