

WATER RESOURCES AND ENVIRONMENTAL SCIENCE TECHNOLOGY

GATEWAYCC.EDU/WATER-TECHNOLOGY

[INFORMATION PACKET]



**GATEWAY
COMMUNITY COLLEGE**
A MARICOPA COMMUNITY COLLEGE



MARICOPA
COMMUNITY COLLEGES

The Maricopa County Community College District (MCCCD) is an EEO/AA institution and an equal opportunity employer of protected veterans and individuals with disabilities. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, age, or national origin. A lack of English language skills will not be a barrier to admission and participation in the career and technical education programs of the District.

The Maricopa County Community College District does not discriminate on the basis of race, color, national origin, sex, disability or age in its programs or activities. For Title IX/504 concerns, call the following number to reach the appointed coordinator: (480) 731-8499. For additional information, as well as a listing of all coordinators within the Maricopa College system, <http://www.maricopa.edu/non-discrimination>.

For the latest information on programs, graduation rates and other important consumer information, please visit our website at gatewaycc.edu

INFORMATION AND APPLICATION GUIDE

Welcome to the Water Resources and Environmental Science Technology Program at GateWay Community College

If you have any questions about the enclosed program material, please feel free to contact any of the following program contacts:

Roman Diaz, Program Director

Water Resources and Environmental Science Technology Program

South Building – Room SO 1306

Phone: (602) 286-8659

Email: roman.diaz@gatewaycc.edu

Dr. Craig Urbanski, Residential Faculty

Water Resources and Environmental Science Technology Program

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Disclaimer: This document is for informational purposes only. The official program(s) description can be found at: gatewaycc.edu/degrees-certificates/water-resources-and-environmental-science-technology

Associate in Applied Science (AAS) in Water Resources Technologies: Program #3830

Certificate of Completion (CCL) – Environmental Science Technology #5553

Certificate of Completion (CCL) – Water and Wastewater Treatment #5136

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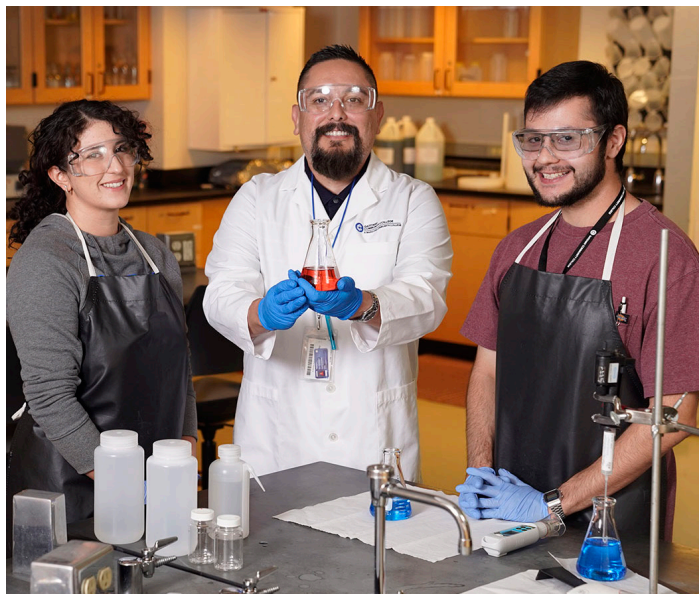
REGISTRATION CHECKLIST

<input type="checkbox"/> Steps to Enroll https://admissions.maricopa.edu/	Enrollment Services: (602) 286-8000
<input type="checkbox"/> Verify Student Identity Enrollment Services https://my.maricopa.edu/services/admissionsrecordsregistration/proof-identity-iauthentication	Enrollment Services: (602) 286-8000
<input type="checkbox"/> Send Official Transcript and/or High School Transcripts: GateWay Community College, Admissions and Records 108 North 40th Street, Phoenix, AZ 85034 https://www.gatewaycc.edu/enroll/admissions	Admissions and Records (602) 286-8200
<input type="checkbox"/> Take Course Placement Test (if applicable) Some courses and programs require test scores prior to enrollment. https://www.gatewaycc.edu/testing No fee required. BRING PICTURE ID. Call for times.	Testing Center (602) 286-8160
<input type="checkbox"/> Apply for Financial Aid and Scholarships: https://www.gatewaycc.edu/financial-aid FASFA: https://studentaid.gov/	Maricopa Financial Aid (480) 731-8900 GateWay Financial Aid (602) 286-8117
<input type="checkbox"/> Meet with an Industrial Technology Program Advisor Explore program options, obtain registration advisement. https://www.gatewaycc.edu/advisement	Academic Advising (602) 286-8600
<input type="checkbox"/> Register for Courses Find a Class: http://classes.sis.maricopa.edu/ Student Info: https://my.maricopa.edu	Enrollment Services (602) 286-8000
<input type="checkbox"/> Pay Tuition and Fees https://www.gatewaycc.edu/tuition Payment Plans and Payment Extensions Available.	Admissions and Records (602) 286-8200
<input type="checkbox"/> Obtain Student ID: https://www.gatewaycc.edu/student-id	
<input type="checkbox"/> Parking on Campus: https://www.gatewaycc.edu/parking	Campus Police (480) 784-0900 (non-emergency) (602) 286-8911
<input type="checkbox"/> Purchase Books: Bookstore or online at: https://www.gatewaycc.edu/bookstore	Main Bookstore, MA 1200 (602) 286-8400
<input type="checkbox"/> New Student Orientation: https://www.gatewaycc.edu/orientation	(602) 286-8032

PROGRAM AND CAREER INFORMATION

How To Get Started

The Water Resources Technologies Program at GateWay Community College provides the education and skills for the knowledge needed to become a successful operator or technician. Because employers need experienced technicians, the program provides the theoretical concepts as well as hands-on practical experience. This experience is gained by completing the Associate in Applied Science Degree in Water Resources Technologies with a track in Water and Wastewater Treatment. Additionally, water and wastewater operators in the State of Arizona are required to obtain a state certification in order to work in this field, and GateWay offers the ADEQ operator Certification Exams throughout Arizona.



Employment Outlook

Due to population growth, industry demand and a critical need for water – particularly in the Southwest of the United States – Water/Wastewater Treatment Technician positions are expected to increase 10% or more by 2028. For information about employment and salary trends, education requirements, and job descriptions, visit: www.onetonline.org.

Water Resources Technologies Program Costs

Tuition and fees are set by the Maricopa Community College District Governing Board. Tuition is based on the 2022–2023 tuition rate of \$85 per-credit-hour (for in-county students). Tuition and fees are subject to change. Additional fees may apply. Financial Aid and Child Care are available to those who qualify.

Accreditation

GateWay Community College is a Maricopa Community College, accredited by the Commission on Institutions of High Education of the North Central Association of Colleges and Schools, 30 North LaSalle Street, Suite 2400, Chicago, IL 60602-2504. Phone (800) 621-7440

**Certificates of Completion (CCL)
in
Environmental Science Technology
or
Water and Wastewater Treatment**

CERTIFICATES OF COMPLETION

In addition to the AAS degree, GateWay also offers two Certificates of Completion (CCL) in either Environmental Science Technology or Water and Wastewater Treatment.

The **Certificate of Completion (CCL) in Environmental Science Technology** provides education in environmental research and investigation for the purpose of identifying, abating, or eliminating sources of pollutants or hazards that affect either the environment or the health of the population. Using knowledge of various scientific disciplines, may collect, synthesize, study, report, and recommend action based on data derived from measurements or observations of air, soil, and water in preparation for employment.

The **Certificate of Completion (CCL) in Water and Wastewater Treatment** program is designed to provide students with knowledge and skills to meet the challenges of working in a wastewater plant. Students will understand the effective operation and maintenance of wastewater treatment, wastewater collection systems, and wastewater labs. The program assists students in their preparation for Arizona Department of Environmental Quality (ADEQ) examinations.

Arizona DEQ Operator Certification Testing

GateWay Community College is the proctor entity for the ADEQ-ABC Operator Certification Exams in Arizona. You can register for the test and find more information about the tests at: <https://sites.google.com/gatewaycc.edu/adeq-water-operator-cert/home>

You will find links to the ABC's website with information about study guides, sample of exam questions, conversion tables, preparing for the exam, test registration fees and testing locations.

Potential water/wastewater students should visit a local water/wastewater treatment plant to gain additional insight about the operator's job and duties. Students should call the plant in advance to plan for the tour. Many water/wastewater facilities offer guided tours for the community. That visit may help the student decide which program track or operator certification to pursue first.

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations.

There is not a single class that can cover all the Association of Boards of Certifications (ABC) requirements for the certification exams. Our certificate of completions are one attempt to cover most of the required knowledge (and some additional skills that the municipalities have identified for their jobs). Students are encouraged to review the ABC's documents: "Need to Know Criteria" for a list of competencies required by ABC to determine when enough knowledge has been acquired to take the Arizona ADEQ Certification tests: http://www.abccert.org/testing_services/need_to_know_criteria.asp

For those students with previous knowledge on the subject, GateWay offers self-paced online review courses (0.5 credits) to prepare for the exam. Although these courses are semester-long courses, the course material can be reviewed in two weeks or less, depending on the student time availability. These review courses were designed to address most of the ABC's Core Competencies presented in the Need to Know Criteria Documents by using quizzes developed for our formal training courses and quizzes from the ABC's recommended study guides. These review courses **will not** help a student with no previous knowledge on water treatment, wastewater treatment, collections, or distribution. Students cannot become operators in one week as it takes a combination of education and experience for this purpose. GateWay's WRT Certificate of Completions were designed in conjunction with the WRT Advisory Committee for that purpose.

ENVIRONMENTAL SCIENCE TECHNOLOGY CERTIFICATE

Term 1: Full-time

Full-time status is 12 credits to 18 credits per semester.

Course #	Course Name	Requisites	Notes	CAK	Credits
WRT100	Introduction to Water Resources	Prerequisites: Admission to the Water Resources Technology program and placement into MAT120, or MAT121, or MAT122, or MAT150, or MAT151, or MAT152, or higher-level mathematics course for which College Algebra is a prerequisite or permission of the Program Director.	Gateway course		3
WRT108	Fundamentals of Environmental Science Technology	Corequisites: WRT100 or permission of the Program Director.	Critical course		3
BPC110 OR CIS105	Computer Usage and Applications OR Survey of Computer Information Systems	Corequisites: WRT100 or permission of the Program Director.		CS	3
BIO105	Environmental Biology			SQ	4

Term 2

Course #	Course Name	Requisites	Notes	CAK	Credits
WRT117	Geographic Information Systems (GIS)	Prerequisites: Admission into the Water Resources Technology program and (a grade of C or better in BPC110, or CIS105, or permission of Program Director).			3
WRT130	Groundwater Hydrology	Prerequisites: Admission into the Water Resources Technology program and (a grade of C or better in WRT100 or permission of Program Director).			3
WRT150	Introduction to Surface Water Data Collection	Prerequisites: Admission into the Water Resources Technology program and (a grade of C or better in WRT100 or permission of Program Director).			3
WRT153	Environmental Law and Regulations	Prerequisites: A grade of C or better in WRT108 or permission of the Program Director.			3
WRT180	Environmental Sampling and Analysis				5

Course Area Key (CAK)

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CS = Computer/Statistics/Quantitative Application

FYC = First Year Composition

HU = Humanities, Fine Arts, and Design

L = Literacy & Critical Inquiry

MA = Mathematics

SB = Social-Behavioral Sciences

SQ = Natural Sciences Quantitative

WATER AND WASTEWATER TREATMENT CERTIFICATE

Term 1: Full-time

Full-time status is 12 credits to 18 credits per semester.

Course #	Course Name	Requisites	Notes	CAK	Credits
WRT100	Introduction to Water Resources	Prerequisites: Admission to the Water Resources Technology program and placement into MAT120, or MAT121, or MAT122, or MAT150, or MAT151, or MAT152, or higher-level mathematics course for which College Algebra is a prerequisite or permission of the Program Director.	Gateway course		3
WRT140	Water Quality for Treatment Industry	Prerequisites: Admission to the Water Resources Technology program. Prerequisites: A grade of C or better in WRT100 or Corequisites: WRT100 or permission of the Program Director.	Critical course		5
WRT115	Water Technology Calculations	Prerequisites: Admission to the Water Resources Technology program. Prerequisites or Corequisites: WRT100 or permission of Program Director.	Critical course		3
WRT110	Principles of Water Treatment Plant Operations	Prerequisites: Admission to the Water Resources Technology program. Prerequisites or Corequisites: WRT100 or permission of Program Director.			3
MAT120 OR MAT121 OR MAT122 OR MAT15+	Intermediate Algebra OR Intermediate Algebra OR Intermediate Algebra OR College Algebra/ Functions	Prerequisites: A grade of C or better in each of the following courses: (MAT055, MAT056, and MAT057), OR a grade of C or better in MAT09+, OR an appropriate district placement. OR Prerequisites: A grade of C or better in each of the following courses: (MAT055, MAT056, and MAT057), OR a grade of C or better in MAT09+, OR an appropriate district placement. OR Prerequisites: A grade of B or better in each of the following courses: (MAT055, MAT056, and MAT057), OR a grade of B or better in MAT09+, OR an appropriate district placement. OR No requisites	Critical course OR Higher Level Math for which College Algebra is a prerequisite	MA	6

Term 2

Course #	Course Name	Requisites	Notes	CAK	Credits
WRT121	Operation of Wastewater Treatment Plants	Prerequisites: Admission to the Water Resources Technology program. Prerequisites or Corequisites: WRT100 or permission of Program Director.			3
WRT131	Wastewater Collection Systems Operation and Maintenance	Prerequisites: Admission into the Water Resources Technology program and (a grade of C or better in WRT100 and WRT115, or permission of Program Director).			3
WRT190AA	Water Resources Technologies Seminar				1
WRT204	Water/Wastewater Mechanical Systems, Power, and Instrumentation	Prerequisites: Admission to the Water Resources Technology program and permission of the Program Director.			3
WRT134	Water Distribution System Operation and Maintenance	Prerequisites: Admission into the Water Resources Technology program and (a grade of C or better in WRT100 and WRT115, or permission of Program Director).			3

WATER AND WASTEWATER TREATMENT CERTIFICATE

Course Area Key (CAK)

Gateway Course = Generally the first major-specific course in a pathway.

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CS = Computer/Statistics/Quantitative Application

FYC = First Year Composition

HU = Humanities, Fine Arts, and Design

L = Literacy & Critical Inquiry

MA = Mathematics

SB = Social-Behavioral Sciences

SQ = Natural Sciences Quantitative

Disclaimer

Students must earn a grade of C or better for all courses required within the program.

Course Sequence total credits may differ from the program information located on the MCCCDC curriculum website due to program and system design. This document is for informational purposes only. The official programs description can be found here:

<https://www.gatewaycc.edu/degrees-certificates/applied-technology/environmental-science-technology-5553-ccl>

<https://www.gatewaycc.edu/degrees-certificates/applied-technology/water-and-wastewater-treatment-5136-ccl>

AAS in Water Resources Technologies: Program #5553 and #5136

View MCCCDC's curriculum website for the Certificate of Completion in Water and Wastewater Treatment (<https://aztransmac2.asu.edu/cgi-bin/WebObjects/MCCCDC.woa/wa/freeForm11?id=143271>).

At Maricopa, we strive to provide you with accurate and current information about our degree and certificate offerings. Due to the dynamic nature of the curriculum process, course and program information is subject to change. As a result, the course list associated with this degree or certificate on this site does not represent a contract, nor does it guarantee course availability. If you are interested in pursuing this degree or certificate, we encourage you to meet with an advisor to discuss the requirements at your college for the appropriate catalog year.

**Associate in Applied Science (AAS) in
Environmental Science and Water Resources Technologies**

Environmental Science and Water Resources Technologies

Career Description

The Associate in Applied Science (AAS) in Environmental Science and Water Resources Technologies program is designed to prepare students in theoretical and practical hands-on training in the monitoring of water quality and quantity as well as in water, wastewater, and industrial wastewater treatment. The emphasis is on federal, state, county, and city regulations affecting water quality and quantity management in addition to water/wastewater treatment. The students take part in the operation, calibration, and maintenance of water monitoring field instruments and water and wastewater treatment monitor field equipment. The program assists students in their preparation for ADEQ examinations in both water and wastewater treatment.

Environmental Science and Protection Technicians

research and investigate for the purpose of identifying, abating, or eliminating sources of pollutants or hazards that affect either the environment or the health of the population. Using knowledge of various scientific disciplines, may collect, synthesize, study, report, and recommend action based on data derived from measurements or observations of air, soil, and water in preparation for employment. Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations.

How To Get Started

GateWay is the only college in the state of Arizona to offer an Associate in Applied Science (AAS) degree in Environmental Science and Water Resources Technologies.

Employment Outlook

Employment of environmental science and protection technicians is projected to grow 10 percent from 2018 to 2028, faster than the average for all occupations. Heightened public interest in issues involving the environment, such as fracking, as well as the increasing demands placed on the environment by population growth, is expected to spur demand for environmental science and protection technicians.

Most employment growth for environmental science and protection technicians is projected to be in the industry of management, scientific, and technical consulting services. More businesses and governments are expected to use these firms in the future to help them monitor and manage the environment and comply with regulations.



PROGRAM AND CAREER INFORMATION

Water and Wastewater Treatment

Water quality matters. Whether the water is coming out of the faucet in your kitchen, or is the output of a technology company's manufacturing plant, human safety and local, state and federal requirements mandate that water be the highest quality and purity, all the time. Key to this process is Water/Wastewater Treatment Technicians, also known as Wastewater Treatment or Collections Operators, Water Treatment or Distribution Operations or Facilities Technicians.

The primary job duties of operators and technicians include responsibility for the proper operation and maintenance of a water supply or wastewater treatment facility in order to produce the highest quality water needed for municipal and industrial systems. This means acquiring an in-depth understanding of exactly how machinery and processes work in order to troubleshoot problems, streamline operations, repair or correct break-downs and in general, make everything run smoothly: workforwater.org



What Can I Expect In This Program?

This program provides theoretical and practical hands-on training in water treatment, wastewater treatment and industrial wastewater treatment. It emphasizes federal, state, county and state regulations affecting water/wastewater treatment as well as: operation, calibration and maintenance of water and wastewater treatment equipment. Additionally, this program provides practical hands-on training in high purity and industrial treatment technologies including operation, calibration, maintenance, and water quality monitoring.

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations.

There is not a single class that can cover all the Association of Boards of Certifications (ABC) requirements for the certification exams. Our certificate of completions are one attempt to cover most of the required knowledge (and some additional skills that the municipalities have identified for their jobs). Students are encouraged to review the ABC's documents: "Need to Know Criteria" for a list of competencies required by ABC to determine when enough knowledge has been acquired to take the Arizona ADEQ Certification tests: http://www.abccert.org/testing_services/need_to_know_criteria.asp

For those students with previous knowledge on the subject, GateWay offers self-paced online review courses (0.5 credits) to prepare for the exam. Although these courses are semester-long courses, the course material can be reviewed in two weeks or less, depending on the student time availability. These review courses were designed to address most of the ABC's Core Competencies presented in the Need to Know Criteria Documents by using quizzes developed for our formal training courses and quizzes from the ABC's recommended study guides. These review courses **will not** help a student with no previous knowledge on water treatment, wastewater treatment, collections, or distribution. Students cannot become operators in one week as it takes a combination of education and experience for this purpose. Gateway's WRT Certificate of Completions were designed in conjunction with the WRT Advisory Committee for that purpose.

ASSOCIATE IN APPLIED SCIENCE IN ENVIRONMENTAL SCIENCE AND WATER RESOURCE TECHNOLOGIES

Track 1: Environmental Science Technology

Term 1: Full-time

Full-time status is 12 credits to 18 credits per semester.

Course #	Course Name	Requisites	Notes	CAK	Credits
WRT100	Introduction to Water Resources	Prerequisites: Admission to the Water Resources Technology program and placement into MAT120, or MAT121, or MAT122, or MAT150, or MAT151, or MAT152, or higher-level mathematics course for which College Algebra is a prerequisite or permission of the Program Director.	Gateway course		3
WRT108	Fundamentals of Environmental Science Technology	Corequisites: WRT100 or permission of the Program Director.	Critical course		3
BPC110 OR CIS105	Computer Usage and Applications OR Survey of Computer Information Systems	Corequisites: WRT100 or permission of the Program Director.		CS	3
WRT150	Introduction to Surface Water Data Collection	Prerequisites: Admission into the Water Resources Technology program and (a grade of C or better in WRT100 or permission of Program Director).			3
MAT120 OR MAT121 OR MAT122 OR MAT15+	Intermediate Algebra OR Intermediate Algebra OR Intermediate Algebra OR College Algebra/ Functions	Prerequisites: A grade of C or better in each of the following courses: (MAT055, MAT056, and MAT057), OR a grade of C or better in MAT09+, OR an appropriate district placement. OR Prerequisites: A grade of C or better in each of the following courses: (MAT055, MAT056, and MAT057), OR a grade of C or better in MAT09+, OR an appropriate district placement. OR Prerequisites: A grade of B or better in each of the following courses: (MAT055, MAT056, and MAT057), OR a grade of B or better in MAT09+, OR an appropriate district placement. OR No requisites	Critical course OR Higher Level Math for which College Algebra is a prerequisite	CS	3-6
FYE101 OR FYE103	Introduction to Surface Water Data Collection	Introduction to College, Career and Personal Success OR Exploration of College, Career and Personal Success			1-3

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L = Literacy & Critical Inquiry

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SB = Social-Behavioral Sciences

SQ = Natural Sciences Quantitative

ASSOCIATE IN APPLIED SCIENCE IN ENVIRONMENTAL SCIENCE AND WATER RESOURCE TECHNOLOGIES

Track 1: Environmental Science Technology

Term 2

Course #	Course Name	Requisites	Notes	CAK	Credits
WRT117	Geographic Information Systems (GIS)	Prerequisites: Admission into the Water Resources Technology program and (a grade of C or better in BPC110, or CIS105, or permission of Program Director).			3
WRT153	Environmental Law and Regulations	Prerequisites: A grade of C or better in WRT108 or permission of the Program Director.			3
WRT180	Environmental Sampling and Analysis	Prerequisites: A grade of C or better in WRT100 and WRT108 or permission of the Program Director.			5
ENG101 OR ENG107	First-Year Composition OR First-Year Composition for ESL	Prerequisites: Appropriate writing placement test score, or a grade of C or better in ENG091 or ESL097 or WAC101, or a grade of B or better in ALT100, or (a grade of C in ALT100 AND Corequisites: ENG101LL or ENG107LL OR WAC101 OR ENG100A+). OR Prerequisites: Appropriate writing placement test score, or a grade of C or better in ENG091 or ESL097 or WAC101, or a grade of B or better in ALT100, or (a grade of C in ALT100 AND Corequisites: ENG101LL or ENG107LL OR WAC101 OR ENG100A+).		FYC	3
WRT125	Surveying for Water Resources	Prerequisites: A grade of C or better in WRT100 or permission of Department or Division.			2
WRT130	Groundwater Hydrology	Prerequisites: Admission into the Water Resources Technology program and (a grade of C or better in WRT100 or permission of Program Director).			3

Term 3

Course #	Course Name	Requisites	Notes	CAK	Credits
BIO105	Environmental Biology			SQ	4
COM100 OR COM110 OR COM225 OR COM230	Introduction to Human Communication OR Interpersonal Communication OR Public Speaking OR Small Group Communication	No requisites OR No requisites OR Prerequisites: A grade of C or better in ENG101, or ENG107, or equivalent. OR No requisites		SB OR L	3
WRT190AA	Water Resources Technologies Seminar				1
ENG102 OR ENG108 OR ENG111	First-Year Composition OR First-Year Composition for ESL OR Technical and Professional Writing	Prerequisites: Grade of C or better in ENG101. OR Prerequisites: A grade of C or better in ENG107. OR Prerequisites: ENG101 with a grade of C, or better, or permission of Instructor.		FYC OR L	3
WRT152	Water Resources Field Investigations I: Groundwater and Surface Water	Prerequisites: Admission to the Water Resources Technology program. Prerequisites or Corequisites: WRT130 and WRT150, or permission of Program Director.			3

ASSOCIATE IN APPLIED SCIENCE IN ENVIRONMENTAL SCIENCE AND WATER RESOURCE TECHNOLOGIES

Track 1: Environmental Science Technology

Term 4

Course #	Course Name	Requisites	Notes	CAK	Credits
CRE101	College Critical Reading and Critical Thinking	Prerequisites: A grade of C or better in (ENG101 OR ENG107) AND (RDG095 OR RDG100 OR RDG111 OR RDG112 OR RDG113 OR an appropriate district placement or permission of Instructor).	OR Equivalent as indicated by assessment	L	0-3
SB	Social & Behavioral Sciences			L	3
WRT252	Water Resources Field Investigations II: Surveying and Surface Water	Prerequisites: Admission into the Water Resources Technology program and (a grade of C or better in WRT152 or permission of Program Director).			3
HU	Humanities, Fine Arts & Design			HU	3
(CHM130 AND CHM130LL) OR CHM130AA OR (GLG110 AND GLG111)	(Fundamental Chemistry AND Fundamental Chemistry Laboratory) OR Fundamental Chemistry with Lab OR (Geological Disasters and the Environment AND Geological Disasters and the Environment Lab)	Prerequisites: C or better in [(CHM100 or MAT090 or MAT091 or MAT092 or higher or satisfactory math placement) and (RDG100 or RDG100LL, or higher or eligibility for CRE101 as indicated by appropriate reading placement)] or permission of the Instructor. AND Prerequisites OR Corequisites: A grade of "C" or better in CHM130. OR Prerequisites: A grade of C or better in [(CHM090, or MAT090, or MAT091, or MAT092, or higher level mathematics course, OR satisfactory math placement) and (RDG100, OR RDG100LL, or higher, or eligibility for CRE101 as indicated by appropriate reading placement)], or permission of the Instructor, or Department or Division Chair. OR No requisites		SQ or G; SQ in combo w/ GLG111 and G and SQ in combo w/ GLG110	4
RE	Restricted Elective		If the AAA/CPD150 course is selected, the credits will be counted once in term 1		0-6

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ASSOCIATE IN APPLIED SCIENCE IN ENVIRONMENTAL SCIENCE AND WATER RESOURCE TECHNOLOGIES

Track 1: Environmental Science Technology

Restricted Electives

Students preparing to enhance their skill set in the Water Industry may complete zero (0) to six (6) credits with permission of the Water Resources Program Director.

Course #	Course Name	Requisites	Notes	CAK	Credits
WRT+++++	Any WRT Water Resource Technology course(s)				0-6
WRT270AA OR WRT270AB OR WRT270AC	Water Resources Internship OR Water Resources Internship OR Water Resources Internship	Prerequisites: Permission of Department or Division OR Prerequisites: Permission of Department or Division OR Prerequisites: Permission of Department or Division	Students may select only ONE of the three internship courses below for a restricted elective. Internship courses may not be taken more than once.		1-3

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FYC = First Year Composition

HU = Humanities, Fine Arts, and Design

L = Literacy & Critical Inquiry

MA = Mathematics

SB = Social-Behavioral Sciences

SQ = Natural Sciences Quantitative

Disclaimer

Students must earn a grade of C or better for all courses required within the program.

Course Sequence total credits may differ from the program information located on the MCCCDCD curriculum website due to program and system design.

View MCCCDCD's curriculum website for the **Associate in Applied Science in Environmental Science and Water Resources Technologies**

(<https://aztransmac2.asu.edu/cgi-bin/WebObjects/MCCCDCD.woa/wa/freeForm13?id=176641>).

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ASSOCIATE IN APPLIED SCIENCE IN ENVIRONMENTAL SCIENCE AND WATER RESOURCE TECHNOLOGIES

Track 2: Water and Wastewater Treatment

Term 1: Full-time

Full-time status is 12 credits to 18 credits per semester.

Course #	Course Name	Requisites	Notes	CAK	Credits
WRT100	Introduction to Water Resources	Prerequisites: Admission to the Water Resources Technology program and placement into MAT120, or MAT121, or MAT122, or MAT150, or MAT151, or MAT152, or higher-level mathematics course for which College Algebra is a prerequisite or permission of the Program Director.	Gateway course		3
WRT140	Water Quality for Treatment Industry	Prerequisites: Admission to the Water Resources Technology program. Prerequisites: A grade of C or better in WRT100 or Corequisites: WRT100 or permission of the Program Director.	Critical course		5
WRT115	Water Technology Calculations	Prerequisites: Admission to the Water Resources Technology program. Prerequisites or Corequisites: WRT100 or permission of Program Director.	Critical course		3
WRT110	Principles of Water Treatment Plant Operations	Prerequisites: Admission to the Water Resources Technology program. Prerequisites or Corequisites: WRT100 or permission of Program Director.			3
MAT120 OR MAT121 OR MAT122 OR MAT15+	Intermediate Algebra OR Intermediate Algebra OR Intermediate Algebra OR College Algebra/ Functions	Prerequisites: A grade of C or better in each of the following courses: (MAT055, MAT056, and MAT057), OR a grade of C or better in MAT09+, OR an appropriate district placement. OR Prerequisites: A grade of C or better in each of the following courses: (MAT055, MAT056, and MAT057), OR a grade of C or better in MAT09+, OR an appropriate district placement. OR Prerequisites: A grade of B or better in each of the following courses: (MAT055, MAT056, and MAT057), OR a grade of B or better in MAT09+, OR an appropriate district placement. OR No requisites	Critical course OR Higher Level Math for which College Algebra is a prerequisite	MA	3-5
FYE101 OR FYE103	Introduction to College, Career and Personal Success OR Exploration of College, Career and Personal Success				1-3

Course Area Key (CAK)

Gateway Course = Generally the first major-specific course in a pathway.

Critical Course = A course that is highly predictive of future success in a pathway.

CS = Computer/Statistics/Quantitative Application

FYC = First Year Composition

HU = Humanities, Fine Arts, and Design

L = Literacy & Critical Inquiry

MA = Mathematics

SB = Social-Behavioral Sciences

SQ = Natural Sciences Quantitative

ASSOCIATE IN APPLIED SCIENCE IN ENVIRONMENTAL SCIENCE AND WATER RESOURCE TECHNOLOGIES

Track 2: Water and Wastewater Treatment

Term 2

Course #	Course Name	Requisites	Notes	CAK	Credits
WRT204	Water/Wastewater Mechanical Systems, Power, and Instrumentation	Prerequisites: Admission to the Water Resources Technology program and permission of the Program Director.			3
WRT121	Operation of Wastewater Treatment Plants	Prerequisites: Admission to the Water Resources Technology program. Prerequisites or Corequisites: WRT100 or permission of Program Director.			3
WRT131	Wastewater Collection Systems Operation and Maintenance	Prerequisites: Admission into the Water Resources Technology program and (a grade of C or better in WRT100 and WRT115, or permission of Program Director).			3
WRT190AA	Water Resources Technologies Seminar				1
WRT134	Water Distribution System Operation and Maintenance	Prerequisites: Admission into the Water Resources Technology program and (a grade of C or better in WRT100 and WRT115, or permission of Program Director).			3
ENG101 OR ENG107	First-Year Composition OR First-Year Composition for ESL	Prerequisites: Appropriate writing placement test score, or a grade of C or better in ENG091 or ESL097 or WAC101, or a grade of B or better in ALT100, or (a grade of C in ALT100 AND Corequisites: ENG101LL or ENG107LL or WAC101 or ENG100A+). OR Prerequisites: Appropriate writing placement test score, or a grade of C or better in ENG091 or ESL097 or WAC101, or a grade of B or better in ALT100, or (a grade of C in ALT100 AND Corequisites: ENG101LL or ENG107LL or WAC101 OR ENG100A+).		FYC	3

Term 3

Course #	Course Name	Requisites	Notes	CAK	Credits
BPC110 OR CIS105	Computer Usage and Applications OR Survey of Computer Information Systems			CS	3
ENG102 OR ENG108 OR ENG111	First-Year Composition OR First-Year Composition for ESL OR Technical and Professional Writing	Prerequisites: Grade of C or better in ENG101. OR Prerequisites: A grade of C or better in ENG107. OR Prerequisites: ENG101 with a grade of C, or better, or permission of Instructor.		FYC OR L	3
WRT200	Industrial Pretreatment	A grade of C or better required in all Prerequisites. Prerequisites: Admission to the Water Resources Technology program. Prerequisites or Corequisites: WRT100 or permission of Program Director.			3
CRE101	College Critical Reading and Critical Thinking	Prerequisites: A grade of C or better in (ENG101 or ENG107) and (RDG095 or RDG100 or RDG111 or RDG112 or RDG113 or an appropriate district placement or permission of Instructor).	OR Equivalent as indicated by assessment	L	0-3
BIO105	Environmental Biology			SQ	4

ASSOCIATE IN APPLIED SCIENCE IN ENVIRONMENTAL SCIENCE AND WATER RESOURCE TECHNOLOGIES

Track 2: Water and Wastewater Treatment

Term 4

Course #	Course Name	Requisites	Notes	CAK	Credits
(CHM130 and CHM130LL) or CHM130AA or (GLG110 and GLG111)	(Fundamental Chemistry AND Fundamental Chemistry Laboratory) OR Fundamental Chemistry with Lab OR (Geological Disasters and the Environment AND Geological Disasters and the Environment Lab)	Prerequisites: C or better in [(CHM100 or MAT090 or MAT091 or MAT092 or higher or satisfactory math placement) and (RDG100 or RDG100LL, or higher or eligibility for CRE101 as indicated by appropriate reading placement)] or permission of the Instructor. AND Prerequisites or Corequisites: A grade of "C" or better in CHM130. OR Prerequisites: A grade of C or better in [(CHM090, or MAT090, or MAT091, or MAT092, or higher level mathematics course, or satisfactory math placement) and (RDG100, or RDG100LL, or higher, or eligibility for CRE101 as indicated by appropriate reading placement)], or permission of the Instructor, or Department or Division Chair. OR No requisites		SQ or G; SQ in combo w/ GLG111 and G and SQ in combo w/ GLG 110	4
WRT153	Environmental Law and Regulations	Prerequisites: A grade of C or better in WRT108 or permission of the Program Director.			3
SB	Social & Behavioral Sciences			SB	3
WRT240	Water Quality	Prerequisites: A grade of C or better in WRT140, or permission of Department or Division.			3
WRT240LL	Water Quality Field Techniques	Prerequisites or Corequisites: WRT240, or permission of Department or Division			1
WRT221	Water and Wastewater Treatment Plants Administration	Prerequisites or Corequisites: WRT110 or WRT121.			3

Summer Semester (Term 2.5)

Course #	Course Name	Requisites	Notes	CAK	Credits
HU	Humanities, Fine Arts & Design			HU	3
COM100 OR COM110 OR COM225 OR COM230	Introduction to Human Communication OR Interpersonal Communication OR Public Speaking OR Small Group Communication	No requisites OR No requisites OR Prerequisites: A grade of C or better in ENG101, or ENG107, or equivalent. OR No requisites		SB OR L	3
RE	Restricted Elective				0-6

Restricted Electives

Students preparing to enhance their skill set in the Water Industry may complete zero (0) to six (6) credits with permission of the Water Resources Program Director.

Course #	Course Name	Requisites	Notes	Credits
WRT++++	Any WRT Water Resource Technology course(s)			0-6
WRT270AA OR WRT270AB OR WRT270AC	Water Resources Internship OR Water Resources Internship OR Water Resources Internship	Prerequisites: Permission of Department or Division. OR Prerequisites: Permission of Department or Division. OR Prerequisites: Permission of Department or Division.	Students may select only ONE of the three internship courses below for a restricted elective. Internship courses may not be taken more than once.	1-3

ASSOCIATE IN APPLIED SCIENCE IN ENVIRONMENTAL SCIENCE AND WATER RESOURCE TECHNOLOGIES

Track 2: Water and Wastewater Treatment

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FYC = First Year Composition

HU = Humanities, Fine Arts, and Design

L = Literacy & Critical Inquiry

MA = Mathematics

SB = Social-Behavioral Sciences

SQ = Natural Sciences Quantitative

Disclaimer

Students must earn a grade of C or better for all courses required within the program.

Course Sequence total credits may differ from the program information located on the MCCCDC curriculum website due to program and system design. This document is for informational purposes only. The official programs description can be found here:

<https://www.gatewaycc.edu/environmental-science-technology>

AAS in Water Resources Technologies: Program #3830

View MCCCDC's curriculum website for the **Associate in Applied Science in Environmental Science and Water Resources Technologies**

(<https://aztransmac2.asu.edu/cgi-bin/WebObjects/MCCCDC.woa/wa/freeForm13?id=176641>).

At Maricopa, we strive to provide you with accurate and current information about our degree and certificate offerings. Due to the dynamic nature of the curriculum process, course and program information is subject to change. As a result, the course list associated with this degree or certificate on this site does not represent a contract, nor does it guarantee course availability. If you are interested in pursuing this degree or certificate, we encourage you to meet with an advisor to discuss the requirements at your college for the appropriate catalog year.

COURSE DESCRIPTIONS

Course Pre-Fix	Course Name	Credits	Mode of Instruction
WRT100	Introduction to Water Resources	3	Online/In Person
WRT108	Fundamentals of Environmental Science Technology	3	Online/In Person
WRT200	Industrial Pretreatment	3	Online/In Person
WRT110	Principles of Water Treatment Plant Operations	3	Online
WRT115	Water Technology Calculations	3	Online/In Person
WRT117	Geographic Information Systems (GIS)	3	In Person
WRT121	Operations of Wastewater Treatment Plants	3	Online
WRT125	Surveying for Water Resources	2	In Person
WRT130	Groundwater Hydrology	3	Online
WRT 131	Wastewater Collection Systems Operation and Maintenance	3	Online
WRT 134	Water Distribution System Operation and Maintenance	3	Online
WRT140	Water Quality for Treatment Industry	5	Online/In Person
WRT150	Introduction to Surface Water Data Collection	3	Online
WRT152	Water Resources Field Investigations I: Groundwater and Surface Water	3	Online/In Person
WRT153	Environmental Law and Regulations	3	Online/In Person
WRT180	Environmental Sampling and Analysis	5	Online/In Person
WRT190AA	Water Resources Technologies Seminar	1	Online
WRT204	Water/wastewater Maintenance/ Mechanical Systems Wastewater Treatment	3	In Person
WRT221	Water and Wastewater Treatment Plants Administration +	3	Online
WRT240	Water Quality	3	Online
WRT240LL	Water Quality Field Techniques	1	In Person
WRT252	Water Resources Field Investigations II: Surveying and Surface Water	3	Online/In Person
WRT270AA	Water Resources Internship	1	In Person
WRT270AB	Water Resources Internship	2	In Person
WRT270AC	Water Resources Internship	3	Independent Study

COURSE DESCRIPTIONS

Course Pre-Fix	Course Name	Credits	Mode of Instruction
CIS105	Survey of Computer Information Systems	3	Online/In Person
BPC110	Computer Usage and Applications	3	Online/In Person
BIO 105	Environmental Biology	4	Hybrid
CHM130/ CHM130LL+	Fundamental Chemistry (3) and Lab (1)	4	Online/In Person
COM	Any approved general education course in the Oral	3	Online/In Person
CRE101 or CRE111+ or Equivalent	Critical Reading or Critical Reading for Business and Industry or Equivalent by Assessment	3	Online/In Person
ENG101+ (or ENG107+)	First-Year Composition	3	Online/In Person
ENG102+ or ENG108+ or ENG111+	First-Year Composition or Technical Writing	3	Online/In Person
GLG110/ GLG111	Geological Disasters and the Environment (3) and Lab (1)	4	Online/In Person
MAT120 (or MAT121 or MAT122)	Intermediate Algebra	3-5	

Elective Courses for ALL TRACKS Associate Degree Programs

Course Pre-Fix	Course Name	Credits	Mode of Instruction
Any WRT Course approved by Department or AAA/CPD150	Students preparing to enhance their skill set in the Water Industry may complete zero (0) to six (6) credits with permission of the Water Resources Program Director. Any courses taken to fulfill the Required Courses area may not be used to fulfill the Restricted Electives	0-6	Varies
	Any courses taken to fulfill the Required Courses area may not be used to fulfill the Restricted Electives		

PROGRAM COSTS

Water Resources Technology Degree Cost Estimates

Program	Tuition	Course Fees	Total
Associate of Applied Science (AAS): Track in Environmental Science and Water Resources Technologies Water or Wastewater Treatment	\$6,375	\$520	\$6,895
Certificate of Completion: Water and Treatment/Wastewater Treatment	\$2,210	\$520	\$2,730
Certificate of Completion: Environmental Science Technology	\$2,210	\$520	\$2,730

Please note that these are only estimates, based on the maximum number of credits needed, and do not include books. These estimates may change based on increases to tuition, course fees and book costs. Estimates are based on the 2022 - 2023 tuition rates for in-county students. Additional fees may apply.

STUDENT SERVICES

Academic Advising.....	(602) 286-8600
Admissions and Records.....	(602) 286-8200
Apprenticeship Programs.....	(602) 286-8083
Bookstore.....	(602) 286-8400
Business Services / Cashiers.....	(602) 286-8277
Campus Dining.....	(602) 286-8308
Career Center.....	(602) 238-4380
Children's Learning Center.....	(602) 238-8130
College Police.....	(602) 286-8911
Counseling.....	(602) 286-8900
Disability Resources.....	(602) 286-8171
Enrollment Services.....	(602) 286-8000
Financial Aid.....	(602) 286-8117
Learning Center.....	(602) 286-8800
Library.....	(602) 286-8458
Student Help Desk.....	(602) 286-8413
Student Life and Leadership.....	(602) 286-8700
Testing and Essential Skills Center.....	(602) 286-8160
Veterans Services.....	(602) 286-8076

PROGRAM NOTES

Please note that not all the courses may be offered every semester so you need to plan accordingly. Although it is possible to start the program in the Spring semester, it is strongly recommended that you meet with the program academic advisor prior to start the program to plan your schedule and to help you select the right courses for that semester.

Orientation sessions are offered before the start of every semester to familiarize new and returning students with Canvas (GateWay's Course Management system for online courses) and to provide additional information about the program. It is **strongly recommended** that new students attend these sessions to be informed about the support available to have a successfully experience at GateWay throughout the semester and program.

As a general guideline, you will be spending about nine (9) hours per week (on average) of your personal time for every three-credit college class. Please take this into account when planning your courses for a given semester.

Many of the Water Resources Technologies courses are online. The hands-on approach is achieved by all-day field sessions that are usually scheduled on Fridays/Saturdays. It is **strongly recommended** that the students do not get disconnected from the program main campus activities. GateWay's Water Resources Technologies Program continuously bring to campus many workshops, seminars, water resources constituent group meetings, professional association meetings, etc. (free to the students) to provide networking opportunities. Several of the water resources-related professional associations (such as the Arizona Water Association, the Arizona Flood Management Association, the Arizona Water Well Association, the Arizona Hydrological Society, the Environmental Professionals of Arizona, among others) have special student membership fees and hold meetings at GateWay. Several of these professional organizations support our program by providing scholarship and internship opportunities.

The student club – Water and Various Environmental Sciences (WAVES) is another way for developing these networking opportunities through the different field trips and club meetings that are scheduled throughout the school year.

The students from the Water Resources Technologies program have access to free tutoring services through the GateWay Learning Center. The center provides tutoring support for general education courses. The center also provides tutoring support for the more specialized WRT courses. All of the WRT tutors are professionals working in the Water Resources area (in state, county and local government agencies, private consulting companies) or are plant managers for the local water/wastewater treatment plants. Many have already the proper professional registrations or certifications. These specialized tutors also support the WRT program as adjunct faculty.

The GateWay library has developed a special "virtual" area for the Water Resources Technologies Program. This area contains ample information about internet resources specific for the program specifically for the online courses. It also contains links to citation guides to help the students referencing materials.

Although the WRT program does not guarantee internships or jobs to the students, the program has developed special agreements with local municipalities and other institutions that have established special paid/volunteer internship positions within their organizations to provide additional hands-on experience to the students. One of these organizations has developed an apprenticeship program to address their needs for certified operators. This organization has selected the GateWay's WRT program to provide the education component for their apprenticeship program.