



## GAVILAN COLLEGE INSTRUCTIONAL PROGRAM TEMPLATE

### PURPOSE OF PROGRAM REVIEW

The Institutional Effectiveness Committee (IEC) will review all Gavilan's programs and services according to the mandates of the Chancellor's Office and in accordance with the Accrediting Commission for Community and Junior Colleges (ACCJC) "Rubric for Evaluating Institutional Effectiveness in Program Review". The IEC will use a self-study report provided by each program or service followed by a review process to accomplish its purpose. The final goal of this process is the improvement of all programs and services at Gavilan College, and to achieve sustainable continuous quality improvement as per accreditation standards. The primary objective of the process is to assure the quality of the educational programs at Gavilan College so that they reflect student needs and encourage student success. Review of programs will be undertaken for the following specific purposes:

- A. To evaluate how well a program functions in relation to its outcomes, the mission of the college, the college's institutional goals and priorities, accreditation standards, and the needs of the community.
- B. To strengthen planning, decision making, and scheduling.
- C. To influence program development and improvement.
- D. To assess the collaboration between instructional programs.
- E. To improve the use of college/district resources.
- F. To establish the basis for changes to the strategic plan
- G. To establish the basis for resource allocation requests for incorporation into department unit plans and annual department budget requests
- H. To improve student learning and encourage instructional innovation.
- I. To address equity concerns as determined by state/local definitions.



**GAVILAN COLLEGE**  
**INSTRUCTIONAL PROGRAM SELF STUDY**

NAME OF PROGRAM BEING REVIEWED WTRM  
ACADEMIC YEAR 2017-18  
Revised April 2018

**I. Organizational Details**

Provide an organizational breakdown of your program. Do not include individual's names, only position titles and FTE.

	Title	FTE
Administrator	Dean of Career and Technical Education	1
Faculty - FT		0
Faculty - PT	Instructor	1.6
Professional Support Staff	Administrative Assistant	1

**II. Program Progress (What have you done since your last review)**

This is the first time through the IEC process for the WTRM program. The Water Resources Management program was developed to meet the demand for trained water and wastewater operators, and to meet the needs of industry and communities throughout its service area and beyond. Degree and certificate program graduates will be qualified to seek entry level employment in the public water supply or wastewater treatment industries and incumbent workers will be qualified for more responsible positions with those industries.

A. Review Strategies and Goals on the Strategic Plan site.

([https://www.gavilan.edu/strategic\\_plans/Gavilan\\_StrategicPlan\\_2015\\_2020.pdf](https://www.gavilan.edu/strategic_plans/Gavilan_StrategicPlan_2015_2020.pdf))

Which specific strategies and goals from the list has your program supported in the last three years? Using examples from your past Program Plans or other sources, describe what measures and/or pedagogical modification your program has adopted to support the identified strategies and goals.

The Water Resources Management program supports the following strategies and goals from the College's 2015 - 2020 Strategic Plan:

STRATEGY #1 Optimize enrollment, course offerings, and services to reflect community needs and growth.

Goal #2 Strengthen career programs by participating in regional career technical education collaboratives and initiatives from the Chancellor's Office.



STRATEGY #2 Improve student services and enhance curriculum and programs in order to help students meet their educational, career, and personal goals.

Goal #2 Use student learning outcomes assessment results to inform program plans and make program improvements.

Goal #3 Develop professional development activities for faculty to improve quality of teaching and curriculum for basic skills, career technical, and transfer courses.

As stated in the past three program plans, the main objective of the program is: To improve the quality and increase the quantity of career technical education provided by our system; courses, programs, pathways, credentials (licensure), certificates, and degrees.

In the fall and spring of 2015 - 16, as a part of Phase 2 and Phase 3 of the Water Resources Management program's 3 Phase process, four new courses were developed. The College now offers AA Degrees and Certificates of Achievement in Wastewater Collection Technology Education, Wastewater Technology Education, Water Distribution Technology Education, Water Resource Management, and Water Technology Education.

Measures and/or pedagogical modifications the WTRM program has adopted to support our identified strategies and goals:

- Developed internship opportunities. The first internship started at the engineering firm CH2M for a Wastewater Operator intern.
- Created pathways from High School to College to the Industry.
- Implemented Phase 2 and Phase 3 of the WTRM program plan which included four additional courses and four new degrees/certificates in the field of WTRM.
- Developed a sequence of course offerings to insure that the student's needs are met and that they have the opportunity to take the classes required to earn a degree and/or certificate.
- Established a dedicated classroom in the Multi-Purpose building that the program and its students could call "home".
- Purchased classroom WTRM equipment charts, a bank of computers, and hands-on lab equipment to aide/enhance learning. This was done with available grant/consortium money.

B. What results have you seen because of these modifications? (Include data if available.)

1) A survey taken in the WTRM 105 class during the spring of 2017 indicates the number of students who have completed the following industry certifications. In addition, 5 students gained employment during the spring of 2017 as a result of Gavilan's WTRM program. The student's success on these exams was due in great part to the classes taken at the college. 26 students completed the survey.



Certification	1 <sup>st</sup> Semester Students	2 <sup>nd</sup> Semester Students	2 Year Students
D 1	2		
D 2			
T 1	1		
T 2		3	
OIT		2	
WW 1	1		
WW 2			
LAB			

Gavilan's WTRM program prepares students for obtaining employment in the industry (water/wastewater) and gives them the knowledge base to take industry certification tests and pass them; i.e. Distribution 1 (D 1) and 2 (D 2), Water Treatment 1 (T 1) and 2 (T 2), Wastewater Operator in Training (OIT), Wastewater 1 (WW 1) and 2 (WW 2), and Laboratory Analysis (LAB).

2) The number of students majoring in WTRM has almost doubled in 4 years, from 58 in 2013 - 14 to 97 in 2016 - 17. The modifications made to the program will help to enhance student learning and increase their chances of earning an AA degree and/or certificate. The AA degree is the WTRM programs highest degree available.

Internships provide students with hands-on experience which allow them to practice the skills and knowledge learned in the classroom. Creating pathways provides for a smooth transition from one level to the next. By adding additional degrees and certificates in the program students now have a variety of professional job avenues to pursue in the WTRM field. The development of the sequence of course offerings provides students with the ability to know what semester/year each course will be offered and allow them to plan accordingly as they pursue their degree/certificate. Equipment and computers can be used as a learning tool to augment lectures and class presentations and are beneficial to those students who are tactile learners.

3) Santa Clara Valley Water District created an internship program specifically for Gavilan College's WTRM students. In addition, other water districts have contacted the college to inquire about students available for internships. They have indicated that they will give preference to Gavilan students.

C. What methods does the program use to maintain the integrity of academic standards and achieve consistency within the discipline, particularly in regard to multiple section introductory classes?

- All instructors are required to follow a course syllabus/the course outline of record which includes SLOs for the course.
- Each semester faculty new to the program is mentored by the area's lead faculty member, Leslie Jordan. She provides them with information about the content of the course they will be teaching, including the course's student



learning outcomes; introduces them to Canvas; and discusses college procedures.

D. What are the program's methods for evaluating and modifying the contents of course offerings?

- Advisory Committee feedback.
- Follow the College's five-year curriculum review cycle for courses.  
Started reviewing and consolidating/reducing where possible the number of SLOs for each course.
- Utilize student evaluation comments and instructor evaluations which are done by Gavilan College.

- Student Learning Outcome assessment results.

The instructor teaching WTRM 103, Electrical and Instrumentation, has made several suggestions to revisions to the content for this course, based on the assessments of the SLO's. Changes are being considered.

- Suggested changes to curriculum and/or programs can be made by faculty teaching in the area and/or counselors. These suggested changes are discussed with the programs lead faculty member who then brings them to the area dean and where appropriate the CTE counselor. A collaborative decision is then made. As the program is made up entirely of part-time instructors, information/decisions are conveyed via email, text, and/or individual meetings. An example: At the end of the fall semester one of the college's counselors contacted the WTRM program about a student's inability to meet an electives requirement because the courses listed under that area had either not been offered or had been cancelled. After discussion between the lead faculty member, the area dean, and the CTE counselor a collaborative decision was made to add an additional appropriate course to the electives list for the Water Resource Management degree. In addition, the other 4 WTRM degrees had a different course added to their electives list. This was all done with the student and student success in mind.

E. What staff development efforts has your program undertaken?

- Lead instructor Leslie Jordan has attended several conferences/workshops related to the industry, including the 2016 CTE Faculty Training Institute.
- Faculty is encouraged to attend Gavilan's staff development activities as well as industry related workshops. With all faculty in this program working in the industry, holding down full time jobs, this is realistically not possible.
- WTRM faculty regularly attend industry related conferences/workshops and the knowledge gained is shared with the students as well as helping improve the instructor's skills in teaching their class(es).



F. Is the program currently articulated with regional four-year colleges and universities and district high schools? Does your program currently have an AA-T or AS-T? If not, what are the plans to develop one?

All courses have been developed through the college's curriculum approval process. Course articulation with regional four-year colleges, where possible, has been completed by Gavilan's articulation officer. The program has established a Gavilan Community College District High School to College Course Articulation Agreement between the college and the East Side Union High School District (ESUHSD) for 3 of their engineering classes. AA-T/AS-T degrees are not available for this program. The AA is the highest degree available.

G. If applicable, how does the program meet all local, state, and federal requirements, including professional, or trades and industry organizations?

The State Water Resources Control Board requires certification by those who work in the profession. Instructors who teach in Gavilan's program hold certifications related to the water and wastewater industry. Certifications are based on grade and continuing education units and renewed every 1 - 3 years depending on the agency.

Students in our program know that: "The State Water Board Operator Certification Program (OCP) certifies all operators with the primary goal of protecting public health and the environment by ensuring that the operators are trained in operating water and wastewater systems. In California, all prospective operators must demonstrate to the OCP that they have successfully taken technical training. In fact, before an applicant is even allowed to take an examination, they must document their training by sending college transcripts, diplomas and/or training certificates to the OCP."

Gavilan College's Water Resources Management program will satisfy the requirements for certification of water and wastewater treatment personnel.

During the spring 2017 semester, representatives from the Santa Clara Valley Water District and Cal Water came to talk to students in the WTRM 105 class about current needs in the field and future employment opportunities.

H. How has your program collected information and responded to the needs of the community/field (e.g. advisory council, needs assessment)?

1) Collaboration with the program's Water Resource Management Advisory Committee, which is made up of industry professionals from our service area, has led to:



- The College helped develop engineering classes for the “Green” Engineering Academy at San Jose High School.
- Establishment of a Gavilan Community College District High School to College Course Articulation Agreement between the college and the ESUHSD for 3 of their engineering classes.
- The development of an OSHA Safety course that will be taught at Independence High School in the ESUHSD as part of a dual credit program.
- Approval of a WTRM Occupational Work Experience class so students completing internships could earn credit.
- The Water Resource Advisory Committee approved the development of four additional certificates and degrees within the Water Resource Management Program. All 4 new certificates and degrees have been approved at the Chancellor’s Office. They include:
  - Water Distribution - Students who satisfactorily complete the required courses for this degree will qualify to take the CDPH Grade D-1 through D-5 Water Distribution Operator examinations.
  - Water Technology Education - Students who satisfactorily complete the required courses for this degree will qualify to take the California Department of Public Health (CDPH) Grade T-1 and T-2 Water Treatment Plant Operator examinations.
  - Wastewater Collection Technology Education - Students who satisfactorily complete the required courses for this degree will qualify to take nearly a dozen wastewater related certification examinations offered by the California Water Environment Association (CWEA).
  - Wastewater Technology Education - Students who satisfactorily complete the required courses for this degree will qualify to take the SWRCB certification examination for the Grade 1 Wastewater Plant Operator as well as nearly a dozen wastewater related certification examinations offered by CWEA.

2) In the spring of 2016 lead faculty member Leslie Jordan visited all the high schools in San Benito County to talk about Gavilan’s WTRM program and employment opportunities in the industry. Although there is no data to indicate the effect of this outreach effort, it is felt that any and all efforts by the college and its various programs to education our potential students on the opportunities available to them is a positive one. There is no plan in place to repeat this visitation, however lead faculty member Leslie Jordan indicated that if invited she would repeat the visit.

3) A CTE counselor attended the college’s recent (spring 2018) Career Faire.



4) Lead faculty member Leslie Jordan will be attending a Counselors Department meeting this spring 2018 semester to share information and answer questions about the WTRM program.

5) A monthly review of the California Water Board and State of California EDD websites. According to the State of California Employment Development Department website, jobs as Water and Liquid Waste Treatment Plant and System Operators in California (also called Process Operators, Wastewater Operators, Wastewater Treatment Operators, Wastewater Treatment Plant Operators, Water Plant Operators, and Water Treatment Plant Operators) are “expected to increase by 6.9 percent, or 700 jobs between 2012 and 2022.”

“In California, an average of 60 new job openings per year is expected for Water and Liquid Waste Treatment Plant Workers, plus an additional 360 job openings due to net replacement needs, resulting in a total of 420 job openings. In San Benito and Santa Clara Counties, an average of 13 job openings due to net replacement needs is expected per year”. These projections are based on; “An increasing population, the retirement of the baby boomer generation, and an increased focus on environmentally sustainable business practices are expected to boost demand for water and wastewater treatment services. As new treatment plants are constructed to meet this increased demand, new Water and Wastewater Treatment Plant and System Operator jobs will become available. Furthermore, the number of applicants for these jobs is normally low, due primarily to the physically demanding and unappealing nature of some of the work.”

J. Review the Gavilan College Equity Report Executive Summary  
([http://www.gavilan.edu/staff/equity/docs/2015-16\\_StudentEquityPlan.pdf](http://www.gavilan.edu/staff/equity/docs/2015-16_StudentEquityPlan.pdf)).

a. What efforts has your program undertaken to mitigate identified inequities, and what was the outcome?

The WTRM program has completed the following activities which it believes contributes to the College’s Equity Committees overarching goal of providing disproportionately impacted populations the best pathways to fulfilling and meaningful lives.

- Lead faculty member Leslie Jordan visited all the high schools in San Benito County in the spring of 2016 to talk about Gavilan’s WTRM program and their possible interest. This presentation was made to the students in all science classes at the traditional high schools and to all students who attend the continuation high schools. This activity most likely involved presentation’s to several of the Equity Plan’s targeted groups. The WTRM lead faculty member has met and will continue to meet with the area dean about how to reach out to the targeted groups. There is currently a larger CTE program effort spearheaded by Dean Sherrean Carr to reach out to all feeder high schools in the district and to the different sectors of the communities.





This is intended to target these identified populations. WTRM will be a part of this effort.

- During the spring 2017 semester, representatives from the Santa Clara Valley Water District and Cal Water came to talk to students in the WTRM 105 class about current needs in the field and future employment opportunities. As a result of this experience, a panel discussion by water industry human resource professionals will happen this spring semester (April 26<sup>th</sup> at 6 pm) for all five WTRM classes being offered. During this time the students will be able to experience a mock job interview, participate in resume writing, and hear about job opportunities.
- Establishing a sequence of course offerings to insure that the students have the opportunity to take the classes required to earn those degrees and/or certificates.
- Implemented Phase 2 and Phase 3, of the 3 Phase Plan, which included the addition of 4 new courses and 4 new AA Degrees/Certificates of Achievement. This provides all students, including those in the targeted populations, with additional options towards reaching their degree/certificate.

b. What gaps remain in your program's efforts to serve the identified populations? Use GavDATA to identify these gaps (<http://www.gavilan.edu/about/research/index.php>)

A review of GavDATA as it relates to the identified populations indicates that for the past 4 years (2013 - 14 to 2016 - 17) the WTRM program has been about 10% above the college's overall success rate for the targeted groups, specifically: Success Rates by Gender - Male (college average 74%, WTRM 80%); Success Rates for Targeted Ethnic Groups (college average 70%, WTRM 82%). The program is above the college average, as well, in success rates for Asian and Hispanic/Latino students.

The WTRM program should continue their outreach into the different sectors of our district communities to target the identified populations. Working with Dean Carr on the larger CTE outreach efforts will be a part of this plan.

Although there is currently no plan in place, a population that the WTRM program should continue to reach out to is the Veterans.

### III. Program Data



Provide appropriate analysis for the following sections based on data acquired from the Office of Institutional Research. (<http://www.gavilan.edu/about/research/index.php>)

A. Basic description of program.

The Water Resources Management degree program is designed to prepare students for employment by municipal drinking water and wastewater treatment departments or industrial treatment facilities. Careers in water/wastewater technology generally involve the administration, operation and maintenance of both drinking water and wastewater treatment facilities as well as distribution and collection systems. Courses prepare students for certification examinations administered by the State of California as well as those administered by professional associations within the water and wastewater industry. Current instructors are experienced water and wastewater professionals. Classes are built around practical examples of real-world scenarios, demonstrations, and field trips whenever possible. Internships are available through Cooperative Work Experience.

The overall general goal of the program is: To improve the quality and increase the quantity of career technical education provided by our system; courses, programs, pathways, credentials (licensure), certificates, and degrees.

1. Enrollment and FTES

i. Enrollment by top code and course over time (4 years)

Academic Year	2013 - 14	2014 - 15	2015 - 16	2016 - 17
WTRM	305	413	224	284
College Overall	45,660	46,828	50,391	45,586

ii. FTES by top code over time (4 years)

Academic Year	2013 - 14	2014 - 15	2015 - 16	2016 - 17
WTRM	78	50	24	31
College Overall	5,126	5,140	5,161	5,443

iii. Current enrollment by term last available census

Fall 2016	First Census
WTRM	135
College Overall	20,111

2. Student Outcomes

i. Success rate by top code and course and year (4 years).

Academic Year	2013 - 14	2014 - 15	2015 - 16	2016 - 17
WTRM	84%	83%	78%	81%
College Overall	74%	73%	75%	68%

ii. Retention rate by top code and course and year (4 years).



Academic Year	2013 - 14	2014 - 15	2015 - 16	2016 - 17
WTRM				
College Overall				

NOTE: The information for retention rates is not available on GavDATA.

iii. Number of majors by year (4 years).

Academic Year	2013 - 14	2014 - 15	2015 - 16	2016 - 17
WTRM	58	64	66	97

iv. Number of degrees and certificates by top code and year (4 years).

Academic Year	2013 - 14	2014 - 15	2015 - 16	2016 - 17
AA	6	6	7	6
CA	8	7	8	5

v. If your program has courses that are required to be completed in sequence, (i.e. English, Math, ESL, etc) what is the success rate for that sequence? (<http://www.gavilan.edu/about/research/index.php>)

N/A

3. Staffing Data

i. Faculty Headcount (by contract and hourly) (past 4 years)

Academic Year	2013 - 14	2014 - 15	2015 - 16	2016 - 17
WTRM Part Time Loads	3.1	3.1	2.5	2.7
College Part Time Loads	461.1	452.1	451.2	253.4

ii. Faculty productivity (Weekly Student Contact Hours [WSCH] divided by Full Time Equivalent Faculty [FTEF]) (past 4 years)

Academic Year	2013 - 14	2014 - 15	2015 - 16	2016 - 17
WTRM	762	483	289	345
College Overall	233	240	239	332

iii. Current ethnic and gender distribution of faculty

Academic Year	2017 - 18
Female	5
Male	3
TOTAL	8
African-American	0
Asian-American	0
Hispanic/Latino-American	0
Indian/from India	1
Unknown	0
White	7
TOTAL	8



iv. Contract overload by year (past 4 years)

Academic Year	2013 - 14	2014 - 15	2015 - 16	2016 - 17
WTRM	0	0	0	0

v. Program Release Time (past 4 years)

Academic Year	2013 - 14	2014 - 15	2015 - 16	2016 - 17
WTRM	0	0	0	0

vi. Classified Staff who contribute to the instructional program, e.g.,  
Instructional Assistant, lab supervisor (past 4 years)

Academic Year	2013 - 14	2014 - 15	2015 - 16	2016 - 17
WTRM	0	0	0	0

vii. Student Assistants (tutors, Cal/WORKs, Work Study, etc.) (past 4 years)

Academic Year	2013 - 14	2014 - 15	2015 - 16	2016 - 17
WTRM	0	0	0	0

B. Provide comments on any salient data above.

- Enrollment by top code and course over time (4 years): The huge growth in enrollment for 2014 - 15 can be attributed to the economy. Individuals, especially those in their middle/older ages, were seeking career opportunities and enrolled in our program. The enrollment numbers for 2015 - 16 and 2016 - 17 more correctly reflect our true enrollment.
- Current enrollment by term last available census: A recent review (March 22, 2018) of GavDATA shows first census enrollment for fall 2014 at 179, fall 2015 at 105, and fall 2016 (the most current term available) at 135. So, although the 2016 numbers are not as high as 2014 they are higher than the fall semester before that.
- Success rate by top code and course and year (4 years): Except for 2015 - 16 the success rate for the Water Resources Management program is 10% higher than the college as a whole for the past 4 years.
- Number of majors by year (4 years): The number of students majoring in WTRM has continued to increase, taking a big jump last year (2016 - 17) to 97 from the previous high of 66 in 2015 - 16. The fact that there was a sharp increase in the overall enrollment in the WTRM program during that same year could account for the increase in majors.
- Faculty productivity: The WTRM program is higher than a lot of other disciplines on campus. Most programs are at about 200 whereas the Water program is currently at 345 (2016 - 17). The fact that it is above the overall college's average is worth noting.



C. Budgetary allocations over the past 3 years (4-5-6's and 1-2-3's if applicable).  
See sample below.

Operational Costs	14/15	15/16	16/17
Enter your data: e.g. Travel	0	0	0
e.g. Instructional Supplies	\$500	\$500	\$500

Additional equipment needed to support the program is purchased with categorical funds from the Strong Workforce budget.

D. Provide an overview of how budget allocations have changed over the past three to five years.

No change to general fund support.

E. What were the results of any significant additional budget or resource allocations/reductions over the past three to five years?

N/A

#### IV. Trends Affecting your Program (Data-Driven)

A. Briefly describe your program's strengths and challenges (utilize data to support your contentions).

##### Strengths

- Expert faculty who work in the field and can provide the students with real-life examples.
- The ability to tap into the area high schools and bring in new students to the program. (2 high school students in the fall 2016 semester and 10 in the spring of 2017 from San Benito County High Schools and South Santa Clara County High Schools.) The students indicated they enrolled in the program as a result of presentations by lead faculty member Leslie Jordan.
- The college is involved directly with the Water Career Pathways Advisory Committee. This is another reason why Gavilan's WTRM program is gaining enrollment from the high schools.

##### Challenges

- Faculty or lack of faculty, as industry professionals has full time day jobs.
- Hard to find qualified professionals who have the required minimum qualifications to teach courses.
- The challenge to find and maintain part-time faculty needs to be addressed. Suggestions include: advertise in professional periodicals, work with Gavilan's Human Resources department to recruit instructors, and fliers distributed to the industry including the county water district.



B. Provide a brief review of the past three Program Plans and any emerging themes identified in them.

Continue to acquire categorical funding support from the Strong Workforce budget. Increase general funding support as equipment needs arise.

C. If not mentioned above, what are some of the needs or challenges facing your program? (include support and documentation for your contentions)

- A bigger pool of industry professionals who are qualified to teach. Currently the Collection courses cannot be taught as a qualified professional has not been found.
- The industry opening up its doors for additional student internships. Recently hired CTE and Strong Workforce Senior Program Specialist Anne Adamson is working on creating more student internship opportunities.

**V. Program/Student Learning Outcomes**

A. Complete the program/student learning outcome matrix for your program(s). Complete separate matrices for each Chancellor’s approved Degree or Certificate. If assessments have not been completed, provide an update of your program’s work to assess your program-level student learning outcomes.

**Wastewater Collection Technology Education  
AA Degree and Certificate of Achievement**

<b>Program/Student Learning Outcomes</b>	<b>Assessment / Measurement</b>	<b>Result</b>	<b>Use of Results</b>
Given a wastewater collection map book and using common terminology pertaining to collection system components; identify pipeline dimensions, pipe construction materials, pipe fittings, direction of flow, location of valves, services, and lift stations.	practical exam, written exam, homework		
Describe how to locate, inspect, clean, operate, and manage quality control practices within a collection system.	practical exam, written exam, quiz, discussion		
Perform basic mathematical computations and conversions relating to wastewater collection	written exam, performance test, homework		



systems, pressure, volume, velocity, chemical dosage, and hydraulic and organic loading.			
Identify regulations and operate the plant accordingly.	written exam, performance exam		
Be able to pass the California licensure examination in the water industry.	OCP exam results		

**Wastewater Technology Education  
AA Degree and Certificate of Achievement**

<b>Program/Student Learning Outcomes</b>	<b>Assessment / Measurement</b>	<b>Result</b>	<b>Use of Results</b>
Identify, describe, and define the basic principles of wastewater and collection systems and of conventional wastewater treatment plants.	written exam, quiz, practical exam		
Compare and contrast wastewater treatment unit processes including preliminary, primary, secondary, and tertiary treatment.	written exam, practical exam, discussion		
Perform basic mathematical calculations and conversions relating to water flow, pressure, volume, velocity, chemical dosage, and hydraulic and organic loading.	written exam, performance test, homework		
Identify regulations and operate the plant accordingly.	written exam, performance exam		
Be able to pass the California licensure examination in the water industry.	OCP exam results		



**Water Distribution Technology Education  
AA Degree and Certificate of Achievement**

<b>Program/Student Learning Outcomes</b>	<b>Assessment / Measurement</b>	<b>Result</b>	<b>Use of Results</b>
Compare and contrast the different types of water distribution systems, including its components: pumps, motors, meters, valves, pipes, and instrumentation and controls.	written exam, practical exam		
Utilize calculations and conversions to determine water flow, pressure, volume, velocity and force, and chemical dosage used in water distribution systems.	written exam, performance exam, homework		
Utilize water maps and drawings to determine location, type, and characteristics of water distribution systems and its sources.	written exam, practical exam, homework		
Explain pump cavitation, corrosion, cross-connection, air valves, head loss, and main flushing in relation to water, wastewater, collection, distribution, and treatment.	written exam, quiz, practical exam, discussion		
Identify regulations and operate the plant accordingly.	written exam, performance exam		
Be able to pass the California licensure examination in the water industry.	OCP exam results		

**Water Resource Management  
AA Degree and Certificate of Achievement**

<b>Program/Student Learning Outcomes</b>	<b>Assessment / Measurement</b>	<b>Result</b>	<b>Use of Results</b>
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Follow safe practices while applying chemical, microbiological, and mechanical knowledge and skills to maintain proper water and wastewater plant operations.	written exam, performance test		
Apply math and hydraulics skills in proper water and wastewater plant, collection system, and distribution system operations.	written exam, performance test, homework		
Identify regulations and operate the plant accordingly.	written exam, performance exam		
Be able to pass the California licensure examination in the water industry.	OCP exam results		

**Water Technology Education  
AA Degree and Certificate of Achievement**

<b>Program/Student Learning Outcomes</b>	<b>Assessment / Measurement</b>	<b>Result</b>	<b>Use of Results</b>
Identify in detail characteristics and sources of ground water and surface water supplies and explain the effects on quality of geological formations, stratifications, and watershed management.	written exam, quiz, homework		
Compare and contrast the basic principles of each water treatment process and list them in the order performed.	written exam, discussion, homework		
Perform basic mathematical calculations and conversions relating to water flow, pressure, volume, velocity, chemical dosage, and hydraulic and organic loading.	written exam, performance test, homework		



Identify regulations and operate the plant accordingly.	written exam, performance exam		
Be able to pass the California licensure examination in the water industry.	OCP exam results		

All WTRM AA Degrees and Certificates of Achievement had their Program Learning Outcomes revised/reduced this fall 2017 semester. They were approved by the college's curriculum committee at their February 26, 2018 meeting. Wastewater Collection Technology Education reduced their PLO's from 7 to 5, Wastewater Technology Education from 8 to 5, Water Distribution Technology Education from 12 to 6, Water Resources Management from 8 to 4, and Water Technology Education from 10 to 5.

By the end of summer session 2018 at least one Program Learning Outcome from each of the 5 WTRM degrees and certificates will be assessed. The remaining PLO's will be completed by the end of 2018 - 19.

B. What percentage of course-level student outcomes has your program assessed?

There are 27 water/wastewater technology courses. Of those 27, 16 have not yet been taught. Of the 11 courses that have been taught 7 (64%) have had their student learning outcomes assessed.

Note: 7 new offerings (1 in summer session and 6 in the fall) will be taught in 2017 - 18 and will have their SLOs assessed.

## VI. Program Plan/Budget Requests

A. List goals and objectives for the next three to five years that will address the needs and trends identified above and in your course and program level SLO assessment results.

- Increase the number of students who participate in WTRM internships.
- Provide a variety of opportunities for students to participate in panel discussions by water industry professionals; where the students will have the opportunity to experience mock job interviews, participate in resume writing, and hear about job opportunities.
- Establish a method of tracking student progress/success. i.e. OCP certifications, entry into the workforce, enhancing the job opportunities for an individual already employed in the field.



- Acquire additional budget allocations from the general fund for instructional supplies and equipment.
- Continue to develop staff networks with existing state and local water and wastewater management resources, as well as those at the national level, to augment financial and technical assistance for Gavilan College and its Water Resources Management Program.
- To continue convening economic development stakeholders in the water and wastewater management industries to develop comprehensive and sustained collaboration through a project advisory committee, industry partnerships, and participation in meetings and conferences.

B. Provide your current Program Plan (required) which should include these goals and objectives.

As stated in the past three program plans, the main objective of the program is: To improve the quality and increase the quantity of career technical education provided by our system; courses, programs, pathways, credentials (licensure), certificates, and degrees.

## View Program Plan

Department:	Career Technical Education
Academic Year:	Academic Year 2016-17

### Vision / Narrative

The goal of the Occupational Institute:\* (Change name to CTE Institute)To increase success, retention and persistence of students in the CTE programs and ensure a pipeline of students into Gav's CTE programs. \*Components of the CTE Institute:\*It would serve high schools students, including those in high school academies reentry students and anyone interested in a CTE pathway. ROP may be a component. Services may include(and are in no particular order): early registration, soft skill training, connections with business and industry(internships, job shadowing, for example), a designated counselor to guide students through CTE career pathways, assessment to identify career options, assistance with financial aid, identify resources for transfer options, retention techniques and strategies, tutoring, job preparation, job placement components, internship/service learning development and provide outreach and ed plan development. The latest CLASS data indicates 1.34% CTE students from the Fall 06 cohort completed a certificate within 3 years(certificates <30 units). The projected outcome of this project would be to increase completion to 10% for the first year and increase completion rates 5% each year thereafter up to 80% completion rate. The following are some comments from CTE faculty regarding the possibilities for the CTE Institute: "The counselor should be



able to administer and interpret vocational assessment tools. Advising should include such info as salary scales, employment trends, etc."We also need a Career Placement person (help place graduates from CTE programs into Jobs) and we need a Curriculum Development Person for CTE programs (hot new topics and careers) someone that can be in touch with business and industry on a consistent basis. These two functions could be a one person position." "I think the CTE Institute is a terrific idea and also agree that a counselor with more experience with vo/tech tracked students would certainly be beneficial to my students. ""--that the Institute have a capstone course common to all that is like the CSUMB course for community service. This could mean service to the Gav community as well as the local area's non-profit groups. This helps students learn "on the job" as well as provide real world content for their portfolios or resumes. The job placement person could coordinate this right along with post grad/certificate career placement. As an example, half of Gavilan wants DM/CSIS to design their web sites. It is difficult for each department to coordinate and it should be centralized, so that accounting students can help keep track of the DM finances." "Also, someone (or at least a group) who monitors current and future job skills would be great (Curriculum Development Person?). We need to be ahead of the market as it takes so long to develop new courses/programs. In fact, this "FUTURE Career skills" orientation could be a big attraction to Gavilan."

## Program Objectives from Previous Program Plans

AY 11/12	<a href="#">Hire Counselor for Occupational Career Program Institute;increase certificate completion rates (certificates &lt;30 units) to 10% for first year and 5% each year after, up to 80% completion rate</a>	Close	Copy
AY 11/12	<a href="#">Implement new Water Resources Management Program</a>	Close	Copy
AY 12/13	<a href="#">Increase success/transfer to CSUMB in areas of AH, CSIS, DM</a>	Close	Copy
AY 12/13	<a href="#">Hire Counselor for Occupational Career Program Institute;increase certificate completion rates (certificates &lt;30 units) to 10% for first year and 5% each year after, up to 80% completion rate</a>	Close	Copy
AY 14/15	<a href="#">CTE Counselor will provide counseling services for at least 250-300 CTE students per year</a>	Close	Copy
AY 15/16	<a href="#">CTE Counselor will provde counseling and career pathway advisement for at least 427 CTE students per year.</a>	Close	Copy

## Program Objective 1: To improve the quality and increase the quantity of career technical education provided by our system; courses, programs, pathways, credentials(licensure), certificates, degrees

<b>Primary Strategy and Goal(s):</b>	<b>Strategy #1:</b> Optimize enrollment, course offerings, and services to reflect community needs and growth. <b>Goal #2:</b> Strengthen career programs by participating in regional career technical
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	education collaboratives and initiatives from the Chancellor's Office.
IEC Program Review:	No: Mandated: SECTION 1. Part 54.5 (commencing with Section 88820) is added to Division 7 of Title 3 of the Education Code: Part 54.5. STRONG WORKFORCE PROGRAM
SLO Data:	Yes, this Objective is based on SLO data:
Progress:	No

Delete	Activities	Costs
<i>NEW</i>	<a href="#">Create NEW Activity for this Objective</a>	
	<a href="#">Ongoing categorical (SWP) funding to support hire of staff and faculty, strengthen current CTE programs and develop new CTE programs to meet the goals of the Strong Workforce program.</a>	<a href="#">Add Budget Request</a>

## VII. Self Study Summary

Use data provided in this report as well as previous program plans to complete the Self Study Summary. Please provide a narrative summary, which should include an overall description of the program, a summary of the program's progress, a summary of and trends facing the program, and the program's plans for the future (2 page limit).

The program summary will include the following elements:

- A description of the program and the services;
- Significant accomplishments since the last review period;
- Your program's impact on supporting and improving student achievement and student learning outcomes;
- Resource and staffing changes since the last review and their effect on the program;
- Trends affecting the program;
- A list of goals and objectives (typically detailed in program plans) for the short and long term. These should be supported by data provided in the sections above. This should also include a discussion of the Institutional Effectiveness Partnership Initiative indicators and equity goals.  
(<http://www.gavilan.edu/administration/iepi.php>)



### Program Summary

The College's Water Resources Management degree program started in the spring of 2012 in response to the needs identified through statewide and regional assessments. The program developed a Plan which included 3 phases: Phase 1 - Water Resources Management Degree/Certificate and the classes required to earn them; Phase 2 - Water Technology Education Degree/Certificate and Wastewater Technology Education Degree/Certificate and the classes required to earn them; and Phase 3 - Wastewater Collection Technology Education Degree/Certificate and Water Distribution Technology Education Degree/Certificate and the classes required to earn them. It is funded by categorical funding from the Strong Workforce budget as well as additional financial support from the regular college budget.

It should be noted that the WTRM program started out in Community and Contract Education, where the opportunity to explore new classes and programs based on community outreach and employer assessments were provided. It drew widespread interest as the statewide drought worsened and continued to fill classes through several semesters. The program then transitioned over to the credit program where it offers both AA Degrees and Certificates of Achievement.

Although this is the first time through the review process for the WTRM program, accomplishments since the program's inception include: 1) implementing Phase 2 and Phase 3 of the program, which included the addition of 4 new courses and 4 new AA Degrees/Certificates of Achievement; 2) establishing a sequence of course offerings to insure that the students have the opportunity to take the classes required to earn those degrees and/or certificates; 3) partnerships with the WTRM industry to provide student internships; and 4) presentations by lead faculty member Leslie Jordan to all the high schools in San Benito County in the spring of 2016 to talk about Gavilan's WTRM program. These presentations were made to the students in all science classes at the traditional high schools and to all students who attend the continuation high schools.

During the spring 2017 semester, representatives from the Santa Clara Valley Water District and Cal Water came to talk to students in the WTRM 105 class about current needs in the field and future employment opportunities. As a result of this experience, a panel discussion by water industry human resource professionals will happen one evening in the spring semester for all WTRM classes. During this time the students will be able to experience a mock job interview, participate in resume writing, and hear about job possibilities. These opportunities indicate how the program is working to support and improve student achievement.



However, resources and staffing changes continue to have an effect. The WTRM program has been supported by the Industry Driven Regional Collaborative grant awarded through the Economic and Workforce Development Program by the California Community Colleges Chancellor's Office in 2010 as well as Career Pathways Trust grant funding, but, as stated in its program plan, it does need to acquire general funding money from the college for operational costs as needed. Additionally, staffing changes, both positive and negative, may have an effect on the ability of the program to offer certain classes. The program has been unable to find part-time instructors who are qualified to teach the Collections class. Individuals have industry level experience but do not have the degree requirements needed to qualify to teach.

The following trends will impact student enrollment and therefore have an effect on our program: 1) The economy and its effect on student enrollment. 2) The aging water/wastewater work force which will open up opportunities for students entering the program to gain employment. 3) Emphasis on CTE education. Students can attend community college and earn an AA degree and/or certificate and gain well-paying jobs in the field of WTRM. 4) Stronger high school vocational education programs which encourage and provide opportunities for students to enter various trade industries which again, provide well-paying jobs. 5) Dual enrollment and articulation agreements as options to expand the program. 6) The option to expand the program and provide instruction at the new Coyote Valley campus.

Our goals for the short term are to: (1) Complete the Student Learning Outcome assessments for all courses that have been taught. (2) Assess the Program Learning Outcomes for all WTRM degrees and certificates. (3) Expand the opportunities for student internships. (4) Increase the number of students who participate in WTRM work experience. Additionally, long term goals are to: (1) Hire a full-time instructor to anchor the program. (2) Increase the number of students who complete the WTRM program, earning AA Degrees and Certificates of Achievement. (3) Provide the opportunity for current workers in the water and wastewater management industry the courses required for them to increase their economic earnings. (4) Continue to develop staff networks to maximize financial and technical assistance. (5) Funding, both through the college budget process and grants.

As the WTRM credit program began in the fall of 2012, most of the IEPI Framework Indicators are not applicable. However, the Successful Course Completion rate is one that can be measured. In 2013 - 14 the WTRM program's success rate for the 9 courses



taught that year averaged 84% whereas the college's overall success rate was 74%.

We look forward to continuing to work with our students to improve their educational experience and increase their opportunities for professional and economic success, work with our colleagues to accomplish our shared goals and objectives, and work with the college to provide a quality Water Resources Management program.