ANTELOPE VALLEY COLLEGE

Fall 2023 Program Review Report

Division/Area Name: Mathematics, Science, & Engineering / ASTR	For Planning Years: 2024-2025
Name of person leading this review: Dr. Mark McGovern	
Names of all participants in this review: Dr. Mark McGovern	

Part 1. Program Overview: *Briefly describe how the program contributes to the district mission*

Astronomy provides courses that satisfy general education requirements. Completion of these courses allows students to fulfill degree requirements or enroll in upper division courses and programs at accredited four-year institutions through our articulation agreements.

Part 2A: Analyze the program review data (retrieval instructions), including equity data and any internal/external environmental scan information (e.g., surveys, interviews, focus groups, advisory groups, licensure exam scores, & job placement) to identify the program Strengths, Opportunities & Aspirations:

Use the following questions to guide your analysis:

Overall (Use the *Program Review* tab to inform your analysis)
- What are the success and retention rates (S&R) for your discipline? Did they decrease or increase in the last year?
- What are the trends for the number of awards granted? Are the number of awards going up or down?

Equity (Use the *S & R by Demographic Group* or the *Equity* tab to inform your analysis)
- Which racial/ethnic student groups complete their courses at the highest rates?
- Which racial/ethnic student groups experience the largest gaps when compared to the highest-performing group? Analyze the trends across the last review period. If no equity gaps are present, please reflect on the strategies that are working in the *Strengths and Accomplishments* section.

Strengths and Accomplishments: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*

The astronomy discipline offers two classes, introductory astronomy, and astronomy lab. The discipline offers an exciting option for students looking to satisfy their general education needs in science. For majors that are undecided, the discipline offers a wide range of exposure to all areas of STEM that can spark the interest of a student leaning towards a STEM-related field. The astronomy curriculum is unique in that its courses focus on the future of humanity and the role that science plays in establishing a successful one. It widens the cultural and global perspective of the student in a way that no other course can and thus strongly supports the ILOs of the college.

The VSL (Virtual Science Lab aka planetarium) is constantly utilized for outreach opportunities. On an almost weekly basis, K-12 groups are exposed to the type of education and experience that can be typically found in a college setting. This promotes not only STEM-related fields but also excites students to desire to continue their education at AVC and beyond. In addition, we have started to use the VSL and astronomy lab equipment to create events for the campus and the public. We recently hosted a solar eclipse viewing event in October 2023 and a Jupiter in opposition event in November 2023.

For courses within the discipline, we have been able to maintain high success (> 80%) and retention (>90%) rates which stay consistently above the overall college average. Success pretty much stayed the same as the previous year while retention saw a modest increase of 4% points. Regarding equity, retention rates by sex are relatively high (~94%) which is well above the college average. Success rates for females saw a 5%-point increase from last year however success rates for males dropped 8% points which is roughly the average for the college. The highest rates for retention and success for race/ethnicity are found among Hispanic/Latinx (94% and 82%, respectively, this past year) and White Non-Hispanic (94% and 80%, respectively, this past year).

In recent years, we have been able to broaden our online course offerings.

Opportunities and Challenges: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*

The discipline will continue its outreach efforts by getting the word out to a greater number of K-12 institutions in the area for the purposes of promoting STEM careers and the college in general. Additionally, we will continue to use the VSL and telescope equipment to provide enrichment activities for the public.

As a combined result of the pandemic and the catastrophic consequences of AB 705, the discipline has seen a dramatic decline in the mathematical abilities of incoming students. This will likely require working more closely with the Learning Center to meet those challenges.

A major challenge the discipline faces was revealed in the equity program review data. For the past couple of years, the discipline has seen low success rates (65.2% this past year) for African American/Black groups which sits almost ten points lower than the college average. The faculty will review instructional material and methods to ensure we are providing an equitable educational experience for all students. Additionally, faculty professional development training on equity in education will be a valuable resource that we hope can help us close these gaps.

Lastly, the discipline is greatly in need of additional faculty support. With the addition of a single adjunct faculty member, the discipline would be able to widen its course offerings.

Aspirations: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*

The discipline would like to expand its use of the VSL for more K-12 groups and to start allowing for public shows. Additionally, it is desired to offer more than just one lecture course. Perusing the course offerings from nearby community colleges shows that multiple introductory-style courses have been approved for general education requirements. This would allow a greater diversity of courses to be offered and satisfy the desire expressed by some students to continue learning material in astronomy after the completion of ASTR 101.

Part 2B: (Required for CTE) External Data: Advisory Committee Recommendations & Labor Market Data
Astronomy is a non-CTE discipline and as such has no advisory committee.
The only labor market data related to astronomy falls under the category of Atmospheric/Space Sciences Teachers, Postsecondary. It is estimated that there are approximately 400 job openings annual in Los Angeles county.

Part 2C: Review and comment on progress toward past Course Improvement Plans

List your past **Course Improvement Plans** (CIP) and progress toward meeting those plans.

Past Course Improvement Plans	Progress Made
ASTR 101, SLO 1 – Improving Performance. SLO 1 only reached a performance of 60% out of the 70% that is desired. The good news is that this is an improvement over the previous academic year (47% met targets for 2021-2022). Of course, pushing this number to 70% is a top priority for the discipline.	A recent change to instruction and our assessment tool is likely a cause for the improved results. Many changes to instruction were implemented in the last couple of years as a result of analyzing SLO data. In particular, there was a greater emphasis placed on how scientific theories are supported by observational evidence. This change has appeared to improve how students evaluate scientific theories and how students understand the process of scientific inquiry. As a result of these changes, there was a desire to make sure the assessment tool was properly addressing those newer changes as the old tool did not reflect the new implementation. The goal for this academic year is to further develop instructional materials to support the SLO and, if needed, update the assessment tool to ensure it assesses student learning in a manner that matches how the course is taught.
ASTR 101, SLO 2 – Maintaining Satisfactory Progress. SLO 2 had 72.96% of students who met and/or exceeded the expected performance. This is a slight increase (~3%) from last year's results. While targets were technically met it would be good to maintain this performance and improve upon it.	The plan will be to assess the areas that are the most troubling to students and create more explicit examples of how to solve problems of a mathematical nature. This past year the plan was to break down the problem into finer steps to walk students through the methods for how to solve them. For this upcoming year, there will be a greater focus on the conceptual understanding of the problem. This will be implemented to see if an improvement in performance is observed.
ASTR 101L – Maintaining Satisfactory Progress. The results for both SLOs have been good. In order to maintain this satisfactory progress, it will be important to make sure equipment is replaced or upgraded in a timely fashion.	The astronomy discipline maintains a collection of telescopes that are used by students for various lab activities. We have been using this equipment for over a decade and it would greatly benefit the discipline to obtain a newer set of equipment and possibly explore getting additional optical equipment to improve the quality of some of the exercises. Additionally, the use of software for simulation purposes should be expanded to further the understanding and success of our students. It will likely be necessary to replace outdated or failing equipment to maintain the same level of student performance. Furthermore, the acquisition of software, beyond what we currently own, to simulate astronomical behavior may be advantageous. No progress other than planning has occurred to date.

Part 2D: Review and comment on progress towards past program review goals:

List your past program review goals and progress towards those goals.

Past Goal	Progress Made
#1 VSL Software	Training on the creating of custom software has been undertaken by faculty and some custom content was made and is currently utilized for instruction. Additionally, there is a plan to upgrade the planetarium software to Digistar 7 in order to utilize the latest suite of content available to be purchased.
#2 Lab Equipment	Several pieces of new lab equipment have been identified but nothing has been purchased yet. However, a few newer lab activities have been implemented based on the currently available equipment.
#3 Lab Manual	Several lab activities have been rewritten to create a single cohesive laboratory manual. Faculty have worked with ENGL 315 (Technical Writing) students to make some of these revisions. Work will continue until a full manual is able to be constructed.
#4 Enrollment	We have been able to offer an additional section of ASTR 101 online. No progress has been made in hiring a part-time instructor.

Part 3: Based on Part 2 above, please list program/area goals for 2023-2024:

Program /Area Goal #	Goal Supports which:				ESP Goal Primarily Supported:	Goal (Student-focused)	Steps to be taken to achieve the goal?	Measure of Success (How would you know you've achieved your goal?)
	ILO	**PLO**	**SLO**	**OO**				
#1 – VSL Software	ILO 2. Creative, Critical, and Analytical Thinking		ASTR 101 SLO #1		Goal 2: Increase efficient and effective use of resources: Technology; Facilities; Human Resources; Business Services	Increase the library of VSL content available for instruction.	The discipline should procure new software for the Virtual Science Lab and renew licenses for current software. Additionally, custom software can be developed by both faculty and students.	VSL system upgraded to Digistar 7. Additionally, the purchase of content from publishers producing Digistar 7 content. As a result of this implementation, we should see an increase in the number of students achieving the targets for our SLOs in ASTR 101.
#2 – Lab Equipment	ILO 2. Creative, Critical, and		ASTR 101 L		Goal 2: Increase efficient and effective use of resources: Technology; Facilities;	Modernize current equipment and incorporate new	New equipment will need to be acquired and introduced into current lab activities. Additionally,	The acquisition of newly purchased equipment and their successful integration into current lab activities. We

	Analytical Thinking		SLO #1		Human Resources; Business Services	equipment in lab activities.	identify and purchase suitable replacement equipment for current lab activities.	should see an increase the number of students achieving the targets for our SLOs in ASTR 101L.
#3 – Lab Manual	ILO 1. Communication		ASTR 101L SLO #1,2		Goal 1: Commitment to strengthening institutional effectiveness measures and practices	Finish the work on the creation of a laboratory manual.	Continue the work on the creation of a lab manual document and provide it to the bookstore for reproduction and use.	The goal is completed once the manual is fully put together and faculty has deemed it suitable for reproduction and distribution.
#4 - Enrollment	Choose ILO		ALL		Goal 2: Increase efficient and effective use of resources: Technology; Facilities; Human Resources; Business Services	Increase course offerings	Contact human resources to continue the call of a part time astronomy instructor.	We see the successful hire of a part time instructor and an increase in the number of sections offered by the discipline.

Part 4: Resource Requests that Support Program Goals (Based on the above analysis, please use the following space to document resource requests)

Type of Resource Request	Summary of Request	Which of your Program/area goals (Part 3) does this request support?	New or Repeat Request	Amount of Request, ($)	One-Time or Recurring Cost, ($)	Contact's Name
Faculty	Hire one adjunct faculty	Goal #4	Repeat	$10,000	Recurring	Jedidiah Lobos (Dean), Alexandra Schroer (Chair), Mark McGovern (Faculty)
Technology	Purchase new licenses or renew licenses for VSL software	Goal #1	Repeat	$30,000	One-time	Jedidiah Lobos (Dean), Alexandra Schroer (Chair), Mark McGovern (Faculty)
Supplies	Purchase new lab equipment (i.e. telescopes, sky maps, sky simulation software, etc.) to replace currently aging equipment.	Goal #2, 3	Repeat	$10,000	One-time	Jedidiah Lobos (Dean), Alexandra Schroer (Chair), Mark McGovern (Faculty)
Professional development	Registration and/or travel to attend conferences and access online material for VSL Training	Goal #1	Repeat	$3,000	Recurring	Jedidiah Lobos (Dean), Alexandra Schroer (Chair), Mark McGovern (Faculty)
Classified Staff	Hire a part-time lab technician/short-term hourly to aid in astronomy/planetarium events	Goal #1,2	New	$30000	Recurring	Jedidiah Lobos (Dean), Mark McGovern (Faculty)

***REQUIRED: After gathering the information above, fill out your RESOURCE REQUESTS to be shared with the Budget Committee:
https://www.surveymonkey.com/r/2023PR_ResourceRequest

Part 5: Insert your Program Review Data here and any other supporting data. (See Part 2A above).
Required:
- Program Review tab
- S&R by Demographic Groups tab
Optional:
- Other supporting data/information

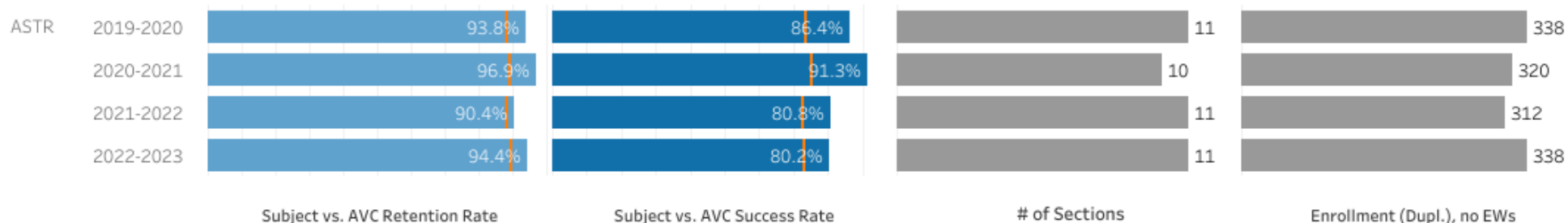Please Select **Subject** area (twice) and **Program Major(s)** to get your data -->

Retention, Success, Number of Sections, & Enrollment in ASTR (Total AVC rates are shown as │ *hover over to see data*)

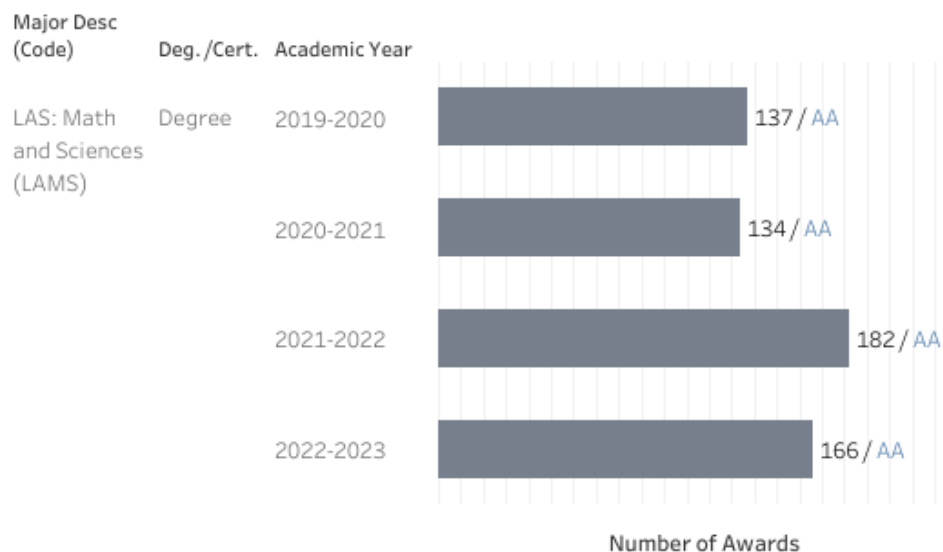| ASTR	Subject vs. AVC Retention Rate	Subject vs. AVC Success Rate	# of Sections	Enrollment (Dupl.), no EWs
2019-2020	93.8%	86.4%	11	338
2020-2021	96.9%	91.3%	10	320
2021-2022	90.4%	80.8%	11	312
2022-2023	94.4%	80.2%	11	338

Enrollment and Number of Sections by *Modality* in ASTR

	Instr. Method	2019-2020	2020-2021	2021-2022	2022-2023
Number of Sections	Online	2	2	2	3
	Traditional	9	8	9	8
Enrollment	Online	94	86	77	121
	Traditional	250	234	236	217

Enrollment and Number of Sections by *Location* in ASTR

	Location	2019-2020	2020-2021	2021-2022	2022-2023
Number of Sections	Lancaster	11	10	11	10
	Palmdale				1
Enrollment	Lancaster	344	320	313	298
	Palmdale				40

Number of Program Awards in LAS: Math and Sciences (LAMS)

Major Desc (Code)	Deg./Cert.	Academic Year	Number of Awards
LAS: Math and Sciences (LAMS)	Degree	2019-2020	137 / AA
		2020-2021	134 / AA
		2021-2022	182 / AA
		2022-2023	166 / AA

FTEF by Contract Type, Part-time/Full-time Ratio, FTES, FTES/FTEF in ASTR

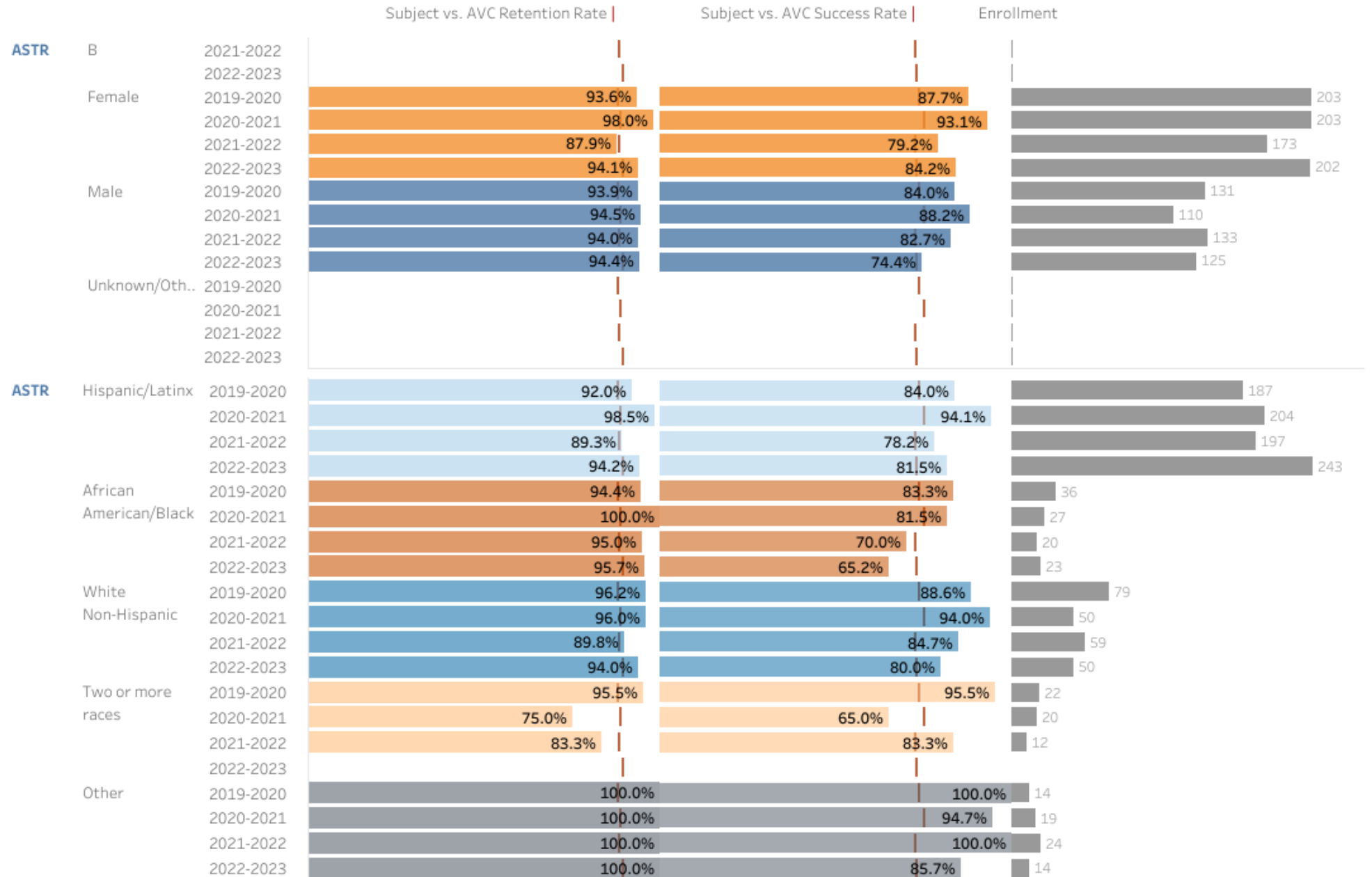|	Fall 2019	Fall 2020	Fall 2021	Fall 2022
PT (Adjunct) FTEF			0	
FT (Regular) FTEF	0	0	0	0
FT (Overload) FTEF	0	0	0	0
TOTAL FTEF	1	1	1	1
PT/FT FTEF Ratio	0	0	1	
FTES	14	15	12	137
FTES/FTEF Ratio	19	18	15	178
WSCH/FTEF Ratio	565	553	462	5,353
WSCH	433	442	354	

Click here
to see AVC's Program awards dashboard

Last Update: 09/30/2022 .Data Sources: AVC's Banner, ARGOS reports

Subject-Level Retention Rate (RR), Success Rate (SR), and Enrollment by Sex & Race/Ethnicity as Compared to AVC's Rates (|)

If the Subject bars are below the vertical lines | , it indicates that equity gaps exist in SR or RR for those sub-groups as compared to overall SS or RR. Some questions to ask when looking at the data:
- What are the potential reasons for equity gaps? - What can my program implement to mitigate these gaps? (Consider such factors as curriculum design, teaching methods, campus climate, and support services.) - What resources/training are available/needed to support these efforts?

			Subject vs. AVC Retention Rate |	Subject vs. AVC Success Rate |	Enrollment
ASTR	B	2021-2022			
		2022-2023			
	Female	2019-2020	93.6%	87.7%	203
		2020-2021	98.0%	93.1%	203
		2021-2022	87.9%	79.2%	173
		2022-2023	94.1%	84.2%	202
	Male	2019-2020	93.9%	84.0%	131
		2020-2021	94.5%	88.2%	110
		2021-2022	94.0%	82.7%	133
		2022-2023	94.4%	74.4%	125
	Unknown/Oth..	2019-2020			
		2020-2021			
		2021-2022			
		2022-2023			
ASTR	Hispanic/Latinx	2019-2020	92.0%	84.0%	187
		2020-2021	98.5%	94.1%	204
		2021-2022	89.3%	78.2%	197
		2022-2023	94.2%	81.5%	243
	African American/Black	2019-2020	94.4%	83.3%	36
		2020-2021	100.0%	81.5%	27
		2021-2022	95.0%	70.0%	20
		2022-2023	95.7%	65.2%	23
	White Non-Hispanic	2019-2020	96.2%	88.6%	79
		2020-2021	96.0%	94.0%	50
		2021-2022	89.8%	84.7%	59
		2022-2023	94.0%	80.0%	50
	Two or more races	2019-2020	95.5%	95.5%	22
		2020-2021	75.0%	65.0%	20
		2021-2022	83.3%	83.3%	12
		2022-2023			
	Other	2019-2020	100.0%	100.0%	14
		2020-2021	100.0%	94.7%	19
		2021-2022	100.0%	100.0%	24
		2022-2023	100.0%	85.7%	14

Division/Area Name: MSE/Biological Sciences	For Planning Years: 2024-2025
Name of person leading this review: Bassam Salameh & Zia Nisani	
Names of all participants in this review: Lena Coleman, Lauren Conroy, Osvaldo Larios-Perez, Patricia M. Palavecino, Nikki Riley	

Part 1. Program Overview: *Briefly describe how the program contributes to the district mission*

The district's mission is to provide a quality, comprehensive education to a diverse population of learners. This includes various transfer degrees and Transfer/General Education Courses. The biology program continues to meet these goals and increase course offerings to facilitate transfer courses for the A.S. and A.S-T in Biology. Currently biology is the 4th largest major on campus and in the 2022-2022 cycle we had 20 (AS-BIOLOGY), 37 (AS-T Biology) & 167 (AA- Liberal Arts in Math & Sciences) degrees granted. Many of our courses are program prerequisites for the Registered Nursing (RN) and other allied health programs. Finally, the program is spearheading the expansion of undergraduate research (UR) at AVC with many faculty being active in mentoring students conducting UR. This gives our students opportunities that are not typically available to community college students and as such, helps with equity gaps in this area. Finally, with the eventual approval of the bachelor's degree in respiratory tech (RT), the biology program will be essential in providing the solid science background that the RT students will need.

Part 2A: Analyze the program review data (retrieval instructions), including equity data and any internal/external environmental scan information (e.g., surveys, interviews, focus groups, advisory groups, licensure exam scores, & job placement) to identify the program Strengths, Opportunities & Aspirations:

Use the following questions to guide your analysis:

Overall (Use the *Program Review* tab to inform your analysis)
- What are the success and retention rates (S&R) for your discipline? Did they decrease or increase in the last year?
- What are the trends for the number of awards granted? Are the number of awards going up or down?

Equity (Use the *S & R by Demographic Group* or the *Equity* tab to inform your analysis)
- Which racial/ethnic student groups complete their courses at the highest rates?
- Which racial/ethnic student groups experience the largest gaps when compared to the highest-performing group? Analyze the trends across the last review period. If no equity gaps are present, please reflect on the strategies that are working in the *Strengths and Accomplishments* section.

Strengths and Accomplishments: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*

(1) The program has a normal distribution of grades. This signifies that the program maintains good standards and does not inflate grades.

(2) Most of the labs in majors and non-majors' courses are inquiry-based where students practice making critical decisions about hypotheses, predictions, and the design and execution of the experiment.

(3) A few faculty have actively engaged in scientific research and have mentored undergraduates. This has resulted in students presenting at conferences and publishing papers in peer-reviewed journals. To date, and since the last program review cycle, more than 20 students have either published or presented at conferences.

(4) The number of sections offered has steadily increased since the decline due to the pandemic, especially in the areas of Anatomy and Physiology.

(5) Our FTES has increased by 7.4% from 298 (Fall 2021) to 320(Fall 2022).

Opportunities and Challenges: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*

(1) The program success rate increased from 64.5% in 2021-2022 to 66.9%. Historically, our success rate hovers around 65-68% and the increase seen (75.6%) in 2020-2021 was mostly due to live online nature of instruction due to the pandemic. Due to the online nature of instruction (including labs), there was a 5% increase in the number of B's and A's awarded in the program. The rigorous nature of biology (science in general) courses might be a factor in keeping the Biology success rate below the overall campus's annual success rate (72.6%). However, when we breakdown the data and look at it (comparing 2021-2022 to 2022-2023) based on race/ethnicity, there are some positive trends. For example, Hispanic/Latinx success rate increased by about 3% to 66.5%, White Non-Hispanic jumped by about 5% to 75.8%, Two or More Races jumped by 7% to 70.5%, with African American/Black holding steady as 52.9%.

(2) African American students are continuing to struggle in biology and have a success rate below department average. We might need to consider summer and semester-imbedded boot camps to help students succeed. Some of these programs should be targeted specifically to this demographic while they are in high school. Also, an institutional or departmental culture of championing achievement can help students embrace and translate their own aspirations into earning a STEM degree. This could be achieved by encouraging and engaging students in undergraduate research throughout their journey at AVC. Finally, have departmental colloquia where we bring in scientists, doctors, etc. to talk and motivate students. Maybe install the mindset that "you can do it also".

(3) Work more closely with students between the ages of 19-24, as they are disproportionately impacted and make up the largest age group in the program. Similar programs mentioned in #2, such as boot camps, high school outreach, etc. could also help this age group.

Aspirations: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*

Biology 100/102
Despite the success in the SLOs, there is an opportunity to offer a three-part series of labs, presented as one optional lab course per month during the semester. The students can come on campus on either a Friday or Saturday and learn: lab safety, the basic bones of the body, and also proper microscope techniques and care. Additionally, aside from technique, a consistent review of all content presented would be offered the last day of the lab series. The students can also learn how to make wet mount preparations of a slide. These labs would serve to fortify knowledge presented in the online class and give the students an opportunity, if they elect to participate, to learn some hands-on skills. It would also be beneficial to both students and interested faculty members, if students express an interest in completing an Honors research project that is simple enough for students to complete within a short window of time.

Biology 101/101L
The course enrolls a mixture of pre-health majors (e.g., nursing students) and non-science majors. The split varies from semester to semester, but usually is close to 50/50. We want our course to adequately prepare the pre-health majors for success in upper division courses such as Anatomy, Physiology, and Microbiology. However, the course must also be accessible to the non-science majors. We strive to meet the needs of both student populations. Biology 101 laboratory is a high enrollment course offered six days a week and serves both non-majors and nursing program majors. Per previous years program goals, Biology 101 has completely updated the laboratory manual with the goal of inquiry-based learning now incorporated throughout the lab. The goal is to keep on the trend of the past year of meeting or exceeding our SLO of student's successful understanding and implementation of the scientific method. The new lab manual includes nine out of fifteen labs that incorporate active-learning of the scientific method. For the future, we would like to make improvements to this entirely new set of labs after several semesters of actual implementation of the lab. We would like to make improvements to student experiments, displays, and materials in order to allow our students to successfully complete their lab.

Biology 103: Since the fall of 2019, BIO 103 (Introduction to Botany) has undergone essential improvements that moved it from being mainly a course that was part of the Agricultural program, which is no longer existent, to slowly become a clear option for Biology students interested in plants and plant sciences or those students who need to complete their GE with a science class with lab. A blended option was also created this Fall (2023) to accommodate students who prefer the online modality, and an Honors option was created as well. We still need time to confirm a positive tendency in enrollment and persistence. More improvements are still required for Bio 103 to become a successful and consistent option for students in our department.

Biology 110/120

We have continued to develop more hands-on, inquiry-based labs and activities to further develop students' scientific skills. For example, in both major's introductory biology courses (Biol 110 and 120), students have been introduced to CURE (Course-Based Undergraduate Research Experience) courses. Some of these projects have resulted in publications and conference presentations. Furthermore, in Biol 120, the students conducted a field journaling project spanning several weeks in their chosen natural setting. In Biol 110, the students are also doing hands-on inquiry-based labs and recently have started doing research projects that might be presented at conferences.

For Biol 110, there is a crucial need to replace or add to our laboratory equipment. This semester we were only able to have two working spectrophotometers. Last year we had three spectrophotometers. We do not have a sufficient number of micropipettes (P1000). Each lab team comprised of four students and found themselves sharing a single P1000 micropipette. The majority of the students in the Fall 2023 semester have expressed the frustration of not having their own when instruction on the proper usage of the micropipettes was presented. This need is accentuated by the fact that micropipettes are used for the majority of the semester.

In the future, we are hopeful that we can continue to develop CURE courses and summer research projects for our students in all of our biological sciences courses. It has become a major priority of the department, as we believe that undergraduate research strengthens written and oral communication, critical thinking, technical skills, and information literacy. The number of faculty working with students in undergraduate research has increased from two biologists to five, with more expressing interest in doing UR in the future. Having a grants and undergraduate coordinator has also helped with developing FPDs, outreach, and communication among faculty. The overall goal is to spread this not only to the division, but the campus community as a whole.

Part 2B: (Required for CTE) External Data: Advisory Committee Recommendations & Labor Market Data
N/A
N/A

Part 2C: Review and comment on progress toward past Course Improvement Plans

List your past **Course Improvement Plans** (CIP) and progress toward meeting those plans.

SLOs that have met and/or exceeded the expected performance:

Biology 100/102 - Both the Biology 100 and Biology 102 courses are online and the students have met or exceeded expectations for the course. A possibility for maintaining this success would be if the students specifically had the course textbooks offered as zero-cost e-textbooks of which the students do not have to pay for the textbooks during the semester that they are enrolled in the course.

Biology 101L - This SLO was met. This last year Biology 101 lab had a complete update. It now has a dedicated lab on the topic of the scientific method and is a theme running throughout the rest of the fourteen lab topics. Further, nine out of fifteen labs incorporate active learning of the scientific method through student-led experiments that require data collection, analysis, and interpretation. In order to sustain and/or improve performance we suggest synchronization of lab topics with the corequisite lecture. As stated in the CIP for the lecture, we respect academic freedom, yet would encourage instructors to align their lecture topics and schedule with that of the lab. In this way, student learning of core concepts in the lecture is then simultaneously reinforced by interactive activities in the lab.

Biology 101 - One SLO was met. Continued recognition among colleagues that "Nothing in biology makes sense except in the light of evolution" (Theodosius Dobzhansky) will allow us to sustain and support student performance in this category. With 10+ instructors teaching the course it is essential for instructors to review and adhere to the COR for Biology 101 lecture. Evolution and the diversity of life are included in the course outline of topics. New instructors should be made aware of the course outline as well. Evolution is now a dedicated topic in the corequisite Biology 101 lab. Student performance can be maintained or improved through simultaneous introduction to these topics in lecture combined with active learning in the lab. Synchronization of the lecture and lab is expanded on in question 2.

Biology 103 - The expected target is 70% for both SLOs. Based on the results recorded last Fall 2022, the performance exceeded the expected target (SLO 1: 84% & SLO 2: 92%). These results are not as usual as we would desire, but more data needs to be collected and compared since significant changes were introduced in 2019. Additionally, this fall, 2023, a new Blended option is being offered for the first time, which slightly but positively impacted the number of enrolled students. This tendency will need to be followed over time, as well as the student's academic performance. Introduction to Botany is slowly but steadily becoming an option for students who need to complete their General Education requirement since this is a science class with a laboratory portion. This class also offers an Honors option that benefits students and increases their knowledge in California flora. Making this course more visible to students will increase the number of students taking this class. So far, the activities and contents set up for this class offer a balanced degree of complexity appropriate for an introductory plant science class. Most students enrolling in the class have not taken previous science classes.

Biology 104 - Both SLOs were met. Each year, both face-to-face and distance education (DEd) versions of this course are offered. Offering this course in different modalities seems to support student needs and student success.

Biology 110 - Of the three SLOs for Biology 110, we exceeded the expected/achievement performance/target for our SLO #3. SLO #3 states "demonstrates an ability to formulate meaningful research questions in molecular-cell biology, designed controlled scientific experiments to investigate those questions, and write up the results in publishable form". Our expected performance is set at 75% and we achieved an 84.62%. To best continue our success, we will continue to have students write and maintain a scientific lab notebook throughout the semester or submit at least two lab reports. The lab notebook/report serves to meet our SLO #3 by assessing students written work while they present their findings in a coherent and constructive discussion/conclusion form.

Biology 120 – SLO1 & SLO2: Both SLOs 1 & 2 targets as a whole for the year were met (SLO1: 79.6% met or exceeded & SLO2 70.3% met or exceeded). The biggest reason SLO1 exceeded the set standard, is implementation of inquiry-based "tree-think" way of teaching evolutionary biology. Phylogenetic trees are the most conventional tool for displaying evolutionary relationships, and "tree-thinking" has been coined as a term to describe the ability to conceptualize evolutionary relationships. Throughout the semester, the students not only learn to read and draw phylogenetic tress, but use those skills in lab, especially when studying fungi, plants, and animals. As such, students apply the skills they learn to real-world biological questions, such as, "How are these two species related?". If this trend continues, we might consider raising the achievement target to 75%. SLO2 highlights the importance of scientific thinking and scientific method. All biology 120 classes are required to have a research project that emphasizes hand-on inquiry-based experience. Biol 120 continues to have inquiry-based and hands-on lab activities. For example, the labs have a designated research project, field journal and online modeling of population genetics. This allows students to get hands-on experience in research, relate subject material to the field, and observe the effect of selection and drift over multiple generations. In some sections the research projects are open-ended and utilize Course-based Undergraduate Research (CUR), so the students learn and are assessed in ways that come as close as possible to the experience of academic staff conducting their disciplinary research. Many of the projects have led to students presenting at scientific conferences designed for undergrads. Overall, we will continue emphasizing evolutionary thinking and research experience in biology 120 classes, as this is the most effective way to train biology students. Other sections, have well designed projects that allow students to do science and learn the various aspects of scientific method.

Biology 204 - All SLO targets were met or exceeded. From the issues encountered on exams, I believe students could use better preparation for this course by making sure the material, such as genetics and use of the microscope, are covered in more detail in the pre-requisite course and lab. Currently we are working on preparing workshops for students and faculty for proper microscope use.

Biology 304 - Overall SLO targets were met or exceeded. A group project for students was introduced last year where students presented their research papers on assigned diseases as a group. Students in this course are usually not very motivated due to the fact it is not in their major area, and they lack the interest. The problem is keeping their interest by making the course relevant to everyday events.

SLOs reporting below the expected performance line:
BIOL 101 - To improve student performance, we plan to pursue to following steps:
1. Standardize SLO assessment methods among the many instructors who teach this course.
   a. Each instructor should create several test questions which address the SLOs. Questions will be pooled, and each semester a randomly selected group of questions should be used by all instructors to assess SLOs. This method should encourage each instructor to thoroughly cover the content relevant to each SLO, rather than teaching to the test.
2. Promote synchronization of Biology 101 lecture and lab topic coverage.
   a. Within the past year, the curriculum for the corequisite, Biology 101 Lab, was majorly updated. This update included a change to the order and substance of topics covered.
   b. The schedule of topic coverage in Biology 101L is set and cannot be changed, due to the logistics of lab preparation. However, instructors of Biology 101 lecture have traditionally been able to set their own schedules of topic coverage.
   c. Despite the change to the schedule of topics in Biology 101L, some instructors have not updated their lecture schedules to match these changes.
   d. We respect the academic freedom of each instructor. However, we argue that student success will improve when topics, especially challenging subjects like photosynthesis (which falls within the purview of the SLO which was not met), are covered at a similar time in Biology 101 lecture and lab.
   e. The co-coordinators of Biology 101 and 101L have previously shared a suggested schedule of Biology 101 lecture topics with peers. Group meetings of Biology 101/101L instructors should be held to promote collaboration and unify objectives.

BIOL 110 - Of the three SLOs for Biology 110, we fell below the expected performance for two SLOs (SLO 1 and SLO 2). SLO #1 states "describe the components of living cells and demonstrate how they interact to allow the state of being alive". Our expected performance is set at 75% and we achieved a 69.75%. A high-impact practice or change which can be implemented to improve student performance is to connect each lecture and lab with at least one of the three principles of the cell theory; Organisms are made of one or more cells (Labs: The Cell, Photosynthesis, Transformation), the cell is the basic unit of life (Lecture: The Cell Structure and Function, DNA replication), and cells give rise to other cells (Lecture on Cell Division).

Another SLO we fell below the expected performance was SLO 2. SLO #2 states "Describe the methods used to culture bacteria, protists, fruit flies, and flowering plants in the laboratory. Employ major experimental laboratory techniques, sometimes in a team context, including centrifugation and gel electrophoresis". Our expected performance is set at 75% and we achieved a 16.24%. A reason for an extremely underperformance report for SLO #2 is that the SLO is somewhat outdated. In Biology 110 we have discontinued culturing protists, fruit flies, nor flowering plants in the laboratory. However, we are transforming chemically competent *E. coli*, culturing the *E. coli* over 48-hours, separating cell (plant) components through centrifugation, and separating DNA through agarose gel electrophoresis. A high-impact practice or change which can be implemented to improve student performance is to assign each student their own experiment regarding one of the following three labs; Transformation, The Cell (centrifugation), and Agarose Gel Electrophoresis. To best assess SLO #2, it will need to be rewritten, so that the first statement "culturing of protists, fruit flies, and flowering plants in the laboratory" is eliminated while keeping the second statement of the SLO. Furthermore, student results for labs "The Cell" and "Gel Electrophoresis" should be used to assess SLO #2.

Additional resources needed to implement the changes:
BIOL 103 - Modification of the laboratory classroom giving it an actual science lab setting will help with the application of safety rules. An instructor microscope connected to a projector so that the images can be shown on a screen to guide students while studying plant structure, will impact positively their learning experience.

BIOL 120 – Due to emphasis on hands-on, inquiry-based teaching, we need proper equipment and materials to teach and conduct the lab in a way that emphasizes high-impact practices. Furthermore, we cannot use items stored in formalin or formaldehyde. Therefore, it may be preferable to order pre-dissected specimens (Biomount Specimens) for students to study, and limit dissections to few species in order to prevent exposure to formalin/formaldehyde-preserved specimens.

Past Course Improvement Plans	Progress Made
Biol 101L: SLO for Biology 101 lab did not meet 70% target at 64% for the 2021-2022 year	2022-2023 year was slightly above the target at 72%
Biol 103: (1)Absence of standardized laboratory activities, (2) No use of microscopes. (3) Scarce microscopic plant material for lab work	(1) Adoption of a Botany science lab manual, (2) Consistent use of microscopes to study plant structures, (3) Labs have almost 85% - 90 % of the biomaterial needed to complete
Biol 120: For the past cycle, the targets for Both SLOs were met and we elected to continue with status quo which is emphasizing inquiry-based lectures, using case studies, incorporating more phylogenetic, and research-based projects. We had recommended that that through training, professional development, and conference attendance, we can expand research opportunities for students and increase hands-on inquiry-based class in our department in general.	Thanks to Title V grant, we now have an Undergraduate Research (UR) coordinator. There have been FPD and workshop opportunities to explain and help faculty in developing their own UR activities. As such, the number of faculty doing research have doubled with more expressing interest.

Part 2D: Review and comment on progress towards past program review goals:

List your past program review goals and progress towards those goals.

Past Goal	Progress Made
Goal 1) Reform instructional methodology to include Inquiry-based learning.	We are continuing to develop more inquiry-based, hands-on labs in our majors classes. In previous semesters, this work has led to students doing undergraduate research (UR) work that has led to publication. We are continuing this effort, and the goal is to spread this inquiry-based education to the non-majors classes such as Biology 101. Recently, a committee of Biology 101 faculty have developed a new lab manual that was first used in Spring 2023. This manual emphasizes hands-on inquiry-based activities.
Goal 2) Improvement of student learning outcomes.	The grade distribution in biology classes tends to follow a normal distribution curve. This suggests that we do not have any potential grade inflation occurring. As mentioned previously, the success rates are below AVC average, but there has been increases in success rates among some demographics. However, we hope by implementing boot camps, high school outreach, and more effective instructions, especially inquiry-based, to increase our success rate.
Goal 3) Develop an undergraduate research (UR) program.	The number of faculty members that are conducting research has increased. Recently, we had papers published with students presenting their work at a conference. In addition, we have ongoing projects that involve students doing research. Biology 120 classes continue to promote UR as part of the class curriculum. Finally, we have been awarded a five-year multimillion dollar grant that has UR as one of its goals. This grant has allowed for the creation of an undergraduate research coordinator which has helped in growing and spreading UR.

Part 3: Based on Part 2 above, please list program/area goals for 2023-2024:

Program /Area Goal #	Goal Supports which:				ESP Goal Primarily Supported:	Goal (Student-focused)	Steps to be taken to achieve the goal?	Measure of Success (How would you know you've achieved your goal?)
	ILO	**PLO**	**SLO**	**OO**				
#1: Reform instructional methodology to include Inquiry-based learning.	ILO 2. Creative, Critical, and Analytical Thinking	BIOL PLOs 1 & 5	Biol 120 SLOs 1 & 2 Biol 110 SLOs 2&3	N/A	**Goal 3:** Focus on utilizing proven instructional strategies that will foster transferable intellectual skills.	Instituting inquiry-based learning in more courses.	Having workshops on developing hands-on lab activities and rewriting lab manuals. Sharing literature on how to develop more inquiry-based labs. Biology 101 has developed and adopted a lab manual (to be used in S2023) that is mostly inquiry-based labs. Finally, by purchasing more supplies and equipment we	By the end of Spring 2023 we will review all the biology lab manuals and account for all the lab exercises that are hands-on inquiry based.

							can develop more hands-on labs for students (this last part also applies to goal 2).	
#2: Improvement of student learning outcomes.	ILO 2. Creative, Critical, and Analytical Thinking	BIOL PLOs 1-5	Biol 120 SLOs 1 & 2 Biol 110 SLOs 1-3	N/A	**Goal 3:** Focus on utilizing proven instructional strategies that will foster transferable intellectual skills.	Increase student success rates.	Trying to develop ways to identify students that are struggling earlier in the semester and referring them to proper services. Developing review workshops that students can attend when struggling.	We will assess student success rates by the end of the 2023-2024 academic cycle.
#3: Develop an undergraduate research (UR) program.	ILO 2. Creative, Critical, and Analytical Thinking	BIOL PLOs 1 & 5	Biol 120 SLO 2 Biol 110 SLOs 2&3	N/A	**Goal 1:** Commitment to strengthening institutional effectiveness measures and practices.	Increasing faculty participation in mentoring student research.	A group of faculty are reading literature and attending UR conferences in order to get ideas on how to implement a permanent UR program on campus. We are also holding discussions and developing UR projects for students to perform in majors' courses. Finally, we have received a recent grant that will support expansion of UR.	Develop a structure whereby the faculty will have access to resources and workshops on developing various activities to implement Ur in their courses.

Part 4: Resource Requests that Support Program Goals (Based on the above analysis, please use the following space to document resource requests)
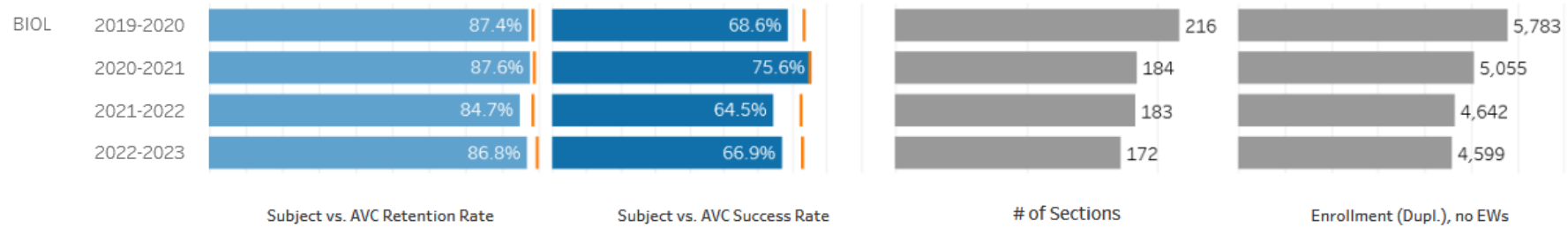
Type of Resource Request	Summary of Request	Which of your Program/area goals (Part 3) does this request support?	New or Repeat Request	Amount of Request, ($)	One-Time or Recurring Cost, ($)	Contact's Name
Classified Staff	Hiring of part time/hourly lab tech for Bio 101 lab	1: Reform instructional methodology to include Inquiry-based learning. 2. Improvement of student learning	New	$30000	Recurring	Lena Coleman Lauren Conroy
Choose an item.			Choose an item.		Choose an item.	
Choose an item.			Choose an item.		Choose an item.	
Choose an item.			Choose an item.		Choose an item.	
Choose an item.			Choose an item.		Choose an item.	

***REQUIRED: After gathering the information above, fill out your RESOURCE REQUESTS to be shared with the Budget Committee:**
https://www.surveymonkey.com/r/2023PR_ResourceRequest

Part 5: Insert your Program Review Data here and any other supporting data. (See Part 2A above).
Required:
- Program Review tab:
  https://public.tableau.com/shared/WB6Z35KRJ?:display_count=n&:origin=viz_share_link
- S&R by Demographic Groups tab:
  https://public.tableau.com/shared/Q25J3HSCW?:display_count=n&:origin=viz_share_link

Retention, Success, Number of Sections, & Enrollment in BIOL (Total AVC rates are shown as | *hover over to see data*)

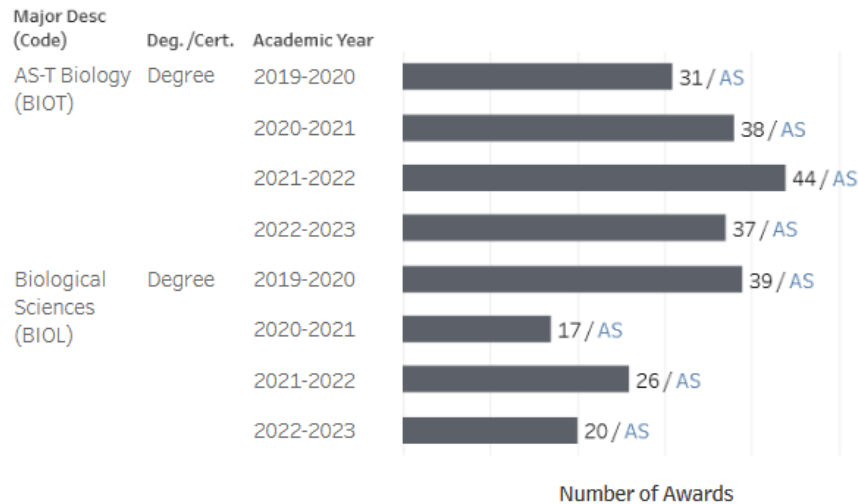|		Subject vs. AVC Retention Rate	Subject vs. AVC Success Rate	# of Sections	Enrollment (Dupl.), no EWs
BIOL	2019-2020	87.4%	68.6%	216	5,783
	2020-2021	87.6%	75.6%	184	5,055
	2021-2022	84.7%	64.5%	183	4,642
	2022-2023	86.8%	66.9%	172	4,599

Enrollment and Number of Sections by *Modality* in BIOL

	Instr. Method	2019-2020	2020-2021	2021-2022	2022-2023
Number of Sections	Online	21	25	30	31
	Other Indep Study			1	1
	Traditional	195	159	152	140
Enrollment	Online	668	698	779	940
	Other Indep Study			1	4
	Traditional	5,340	4,369	3,885	3,661

Enrollment and Number of Sections by *Location* in BIOL

	Location	2019-2020	2020-2021	2021-2022	2022-2023
Number of Sections	Lancaster	198	164	147	139
	Palmdale	18	20	36	33
Enrollment	Lancaster	5,564	4,610	3,769	3,669
	Palmdale	444	457	896	936

Number of Program Awards in AS-T Biology (BIOT) & Biological Sciences (BIOL)

Major Desc (Code)	Deg./Cert.	Academic Year	Number of Awards
AS-T Biology (BIOT)	Degree	2019-2020	31 / AS
		2020-2021	38 / AS
		2021-2022	44 / AS
		2022-2023	37 / AS
Biological Sciences (BIOL)	Degree	2019-2020	39 / AS
		2020-2021	17 / AS
		2021-2022	26 / AS
		2022-2023	20 / AS

FTEF by Contract Type, Part-time/Full-time Ratio, FTES, FTES/FTEF in BIOL

	Fall 2019	Fall 2020	Fall 2021	Fall 2022
PT (Adjunct) FTEF	8	7	5	4
FT (Regular) FTEF	12	13	14	15
FT (Overload) FTEF	4	4	5	4
TOTAL FTEF	24	24	23	23
PT/FT FTEF Ratio	1	1	0	0
FTES	344	340	298	320
FTES/FTEF Ratio	14	14	13	14
WSCH/FTEF Ratio	422	433	385	415
WSCH	10,328	10,214	8,928	

Click here
to see AVC's Program

Last Update: 09/30/2022 .Data Sources: AVC's
Banner, ARGOS reports

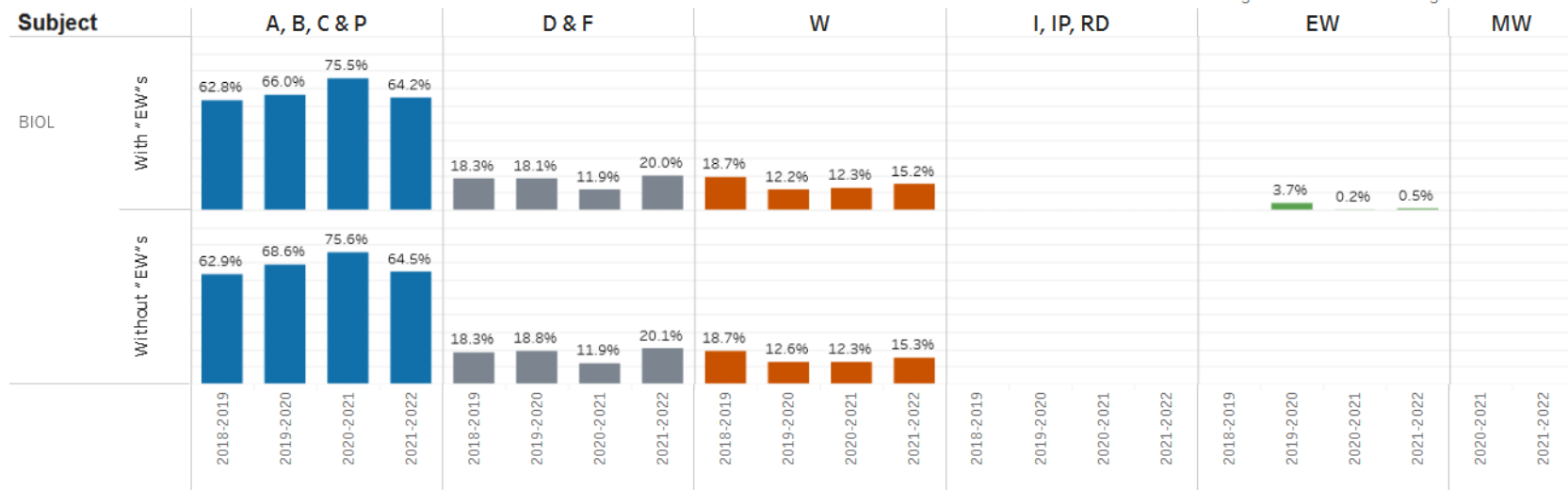| BIOL			Subject vs. AVC Retention Rate	Subject vs. AVC Success Rate	Enrollment
BIOL	B	2020-2021			
		2021-2022			
		2022-2023	87.5%	87.5%	16
	Female	2019-2020	87.9%	68.6%	4,001
		2020-2021	87.5%	75.4%	3,751
		2021-2022	83.9%	63.9%	3,287
		2022-2023	87.0%	66.4%	3,276
	Male	2019-2020	86.5%	69.0%	1,721
		2020-2021	87.7%	75.9%	1,280
		2021-2022	86.5%	65.7%	1,319
		2022-2023	86.3%	68.4%	1,261
	Unknown/Oth..	2019-2020	75.4%	54.1%	61
		2020-2021	100.0%	100.0%	23
		2021-2022	92.9%	78.6%	28
		2022-2023	82.6%	60.9%	46
BIOL	Hispanic/Latinx	2019-2020	87.8%	67.9%	3,602
		2020-2021	87.2%	75.5%	3,137
		2021-2022	85.0%	63.8%	2,955
		2022-2023	88.0%	66.3%	3,108
	African American/Black	2019-2020	80.6%	56.0%	634
		2020-2021	83.0%	60.9%	494
		2021-2022	77.0%	52.6%	508
		2022-2023	78.3%	52.9%	448
	White Non-Hispanic	2019-2020	90.5%	78.9%	788
		2020-2021	91.3%	83.8%	770
		2021-2022	86.6%	70.2%	634
		2022-2023	87.5%	75.8%	598
	Two or more races	2019-2020	87.5%	67.3%	272
		2020-2021	88.7%	75.6%	238
		2021-2022	80.4%	63.8%	199
		2022-2023	81.9%	70.5%	149
	Other	2019-2020	87.9%	74.1%	487
		2020-2021	88.7%	79.3%	416
		2021-2022	92.8%	78.6%	346
		2022-2023	87.8%	74.7%	296

Grade Distribution for BIOL based on all enrolled students, including those who received "EW"s during Spring 2020

MW	IP	I	EW	W	RD	P	NP	F	D	C	B	A

BIOL	2019-2020	12% (W)	9% (F)	9% (D)	24% (C)	25% (B)	17% (A)
	2020-2021	12% (W)	5% (F)	7% (D)	23% (C)	30% (B)	22% (A)
	2021-2022	15% (W)	11% (F)	9% (D)	20% (C)	24% (B)	20% (A)
	2022-2023	13% (W)	11% (F)	9% (D)	21% (C)	25% (B)	21% (A)

BIOL (only shows if n >10)

Minor variation in numbers might occur due to rounding

Subject	A, B, C & P				D & F				W				I, IP, RD				EW				MW	

With "EW"s (BIOL):
- A, B, C & P: 62.8%, 66.0%, 75.5%, 64.2%
- D & F: 18.3%, 18.1%, 11.9%, 20.0%
- W: 18.7%, 12.2%, 12.3%, 15.2%
- EW: 3.7%, 0.2%, 0.5%

Without "EW"s (BIOL):
- A, B, C & P: 62.9%, 68.6%, 75.6%, 64.5%
- D & F: 18.3%, 18.8%, 11.9%, 20.1%
- W: 18.7%, 12.6%, 12.3%, 15.3%

Years (x-axis): 2018-2019, 2019-2020, 2020-2021, 2021-2022 (A,B,C&P; D&F; W; I,IP,RD; EW); 2020-2021, 2021-2022 (MW)

BIOL

FTEF, FTES, FTES/FTEF, & WSCH/FTEF by Major Term (AVC vs. Subject)

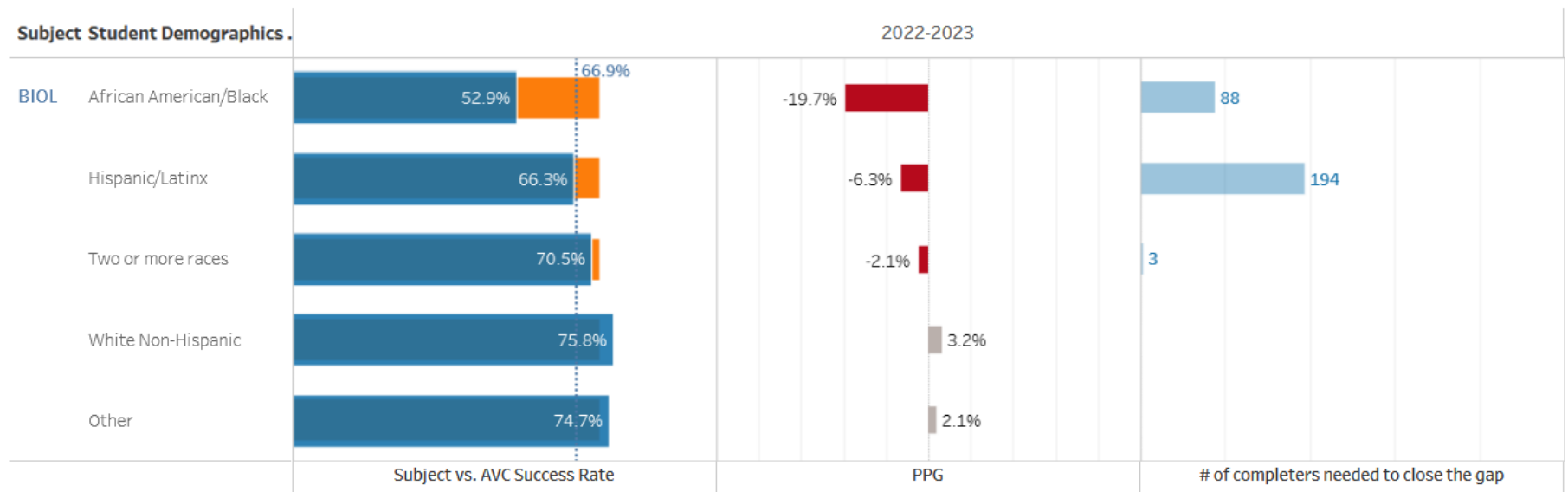FTEF by Contract Type, Part-time/Full-time Ratio, FTES, FTES/FTEF in **BIOL**

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FTES/FTEF Ratio	14	14	13	14
WSCH/FTEF Ratio	422	433	385	415
WSCH	10,328	10,214	8,928	

AVC Total

	Fall 2019	Fall 2020	Fall 2021	Fall 2022
PT (Adjunct) FTEF	188.5	164.9	158.1	146.5
FT(Regular) FTEF	151.2	153.7	141.7	152.1
FT (Overload) FTEF	38.0	35.3	37.6	44.3
TOTAL FTEF	377.6	353.9	337.3	342.9
PT/FT FTEF Ratio	1.2	1.1	1.1	1.0
FTES	4,884.4	4,255.1	3,524.1	4,074.0
FTES/FTEF Ratio	12.9	12.0	10.4	11.9
WSCH/FTEF Ratio	388.0	360.7	313.4	356.4
WSCH	146,531.7	127,651.8	105,723.0	

2022-2023 Disproportionate Impact (DI) as Percentage Point Gap (PPG)

Blue Bars show Success Rate (SR) within the sub-Groups vs. AVC Annual SR (orange bar) vs. BIOL Annual SR (dotted line)

Subject	Student Demographics	Subject vs. AVC Success Rate	PPG	# of completers needed to close the gap
BIOL	African American/Black	52.9%	-19.7%	88
	Hispanic/Latinx	66.3%	-6.3%	194
	Two or more races	70.5%	-2.1%	3
	White Non-Hispanic	75.8%	3.2%	
	Other	74.7%	2.1%	

(BIOL Annual SR dotted line: 66.9%)

In 2022-2023, BIOL's Success Rate was 66.9% vs. AVC's Annual rate of 72.6%

Overall Disproportionate Impact as percentage point gap was : -5.7%

In BIOL, 4,599 was the enrollment count (duplicated headcount) (only shows if *n* > 10)

If there is a Disproportionate impact (PPG is negative), multiply the absolute value of PPG by the number of students and divide it by 100 to determine how many more successful completers would eliminate the gap.

*(For example, (4,599 * |-5.7%|)=261. it means that 261 more successful course completers would help close the gap for this subject area)*

(Hover over each bar in the chart to see details about each sub-group)

Some possible questions to ask when looking at the DI data:

- What are the potential reasons for equity gaps?

- What can my program implement to mitigate these gaps?

- What resources are available to support these efforts?

Click to Include EWs

Subject	Student Demographics		2022-2023	
		Subject vs. AVC Success Rate	PPG	# of completers needed to close the gap
BIOL	B	66.9% / 87.5%	14.9%	
	F	66.4%	-6.2%	204
	M	68.4%	-4.2%	53
	N	60.9%	-11.7%	5

In 2022-2023, BIOL's Success Rate was 66.9% vs. AVC's Annual rate of 72.6%
Overall Disproportionate Impact as percentage point gap was : -5.7%
In BIOL, 4,599 was the enrollment count (duplicated headcount) (only shows if $n > 10$)
If there is a Disproportionate impact (PPG is negative), multiply the absolute value of PPG by the number of students and divide it by 100 to determine how many more successful completers would eliminate the gap.
(For example, (4,599 * |-5.7%|)=261. it means that 261 more successful course completers would help close the gap for this subject area)
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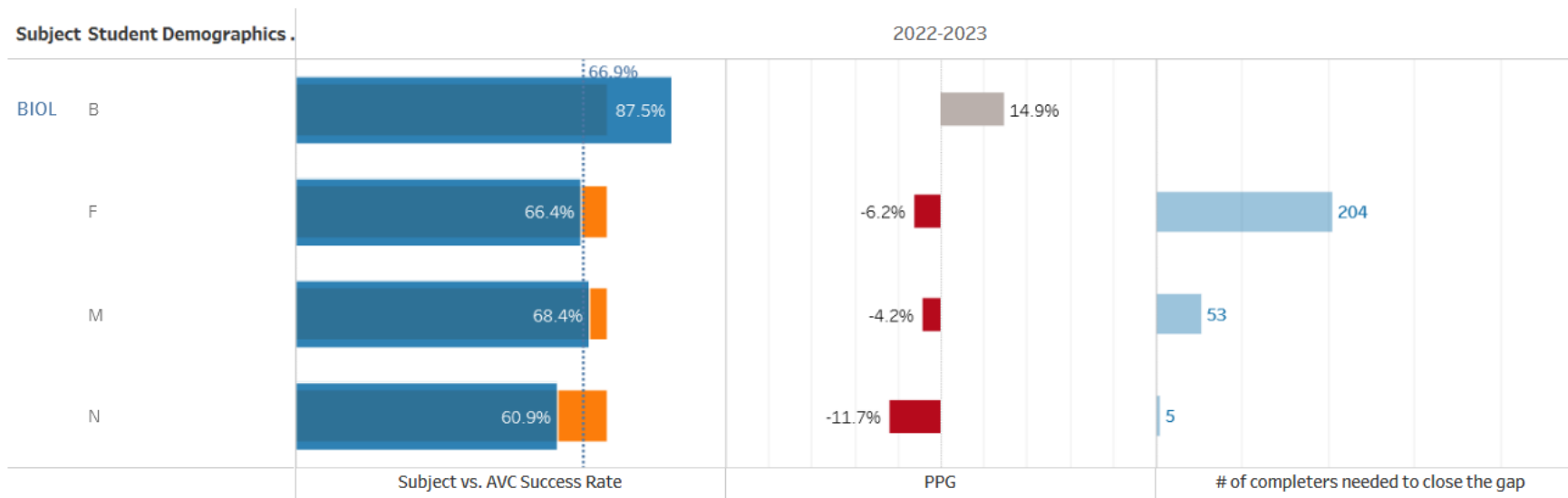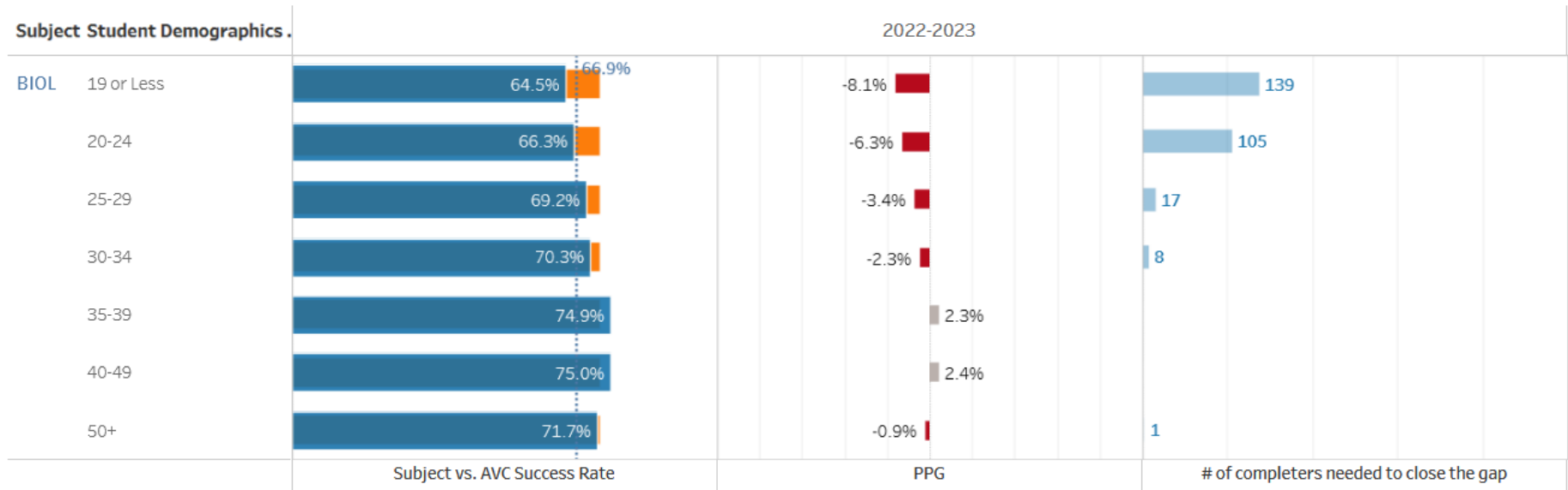Some possible questions to ask when looking at the DI data:
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2022-2023 Disproportionate Impact (DI) as Percentage Point Gap (PPG)
Blue Bars show Success Rate (SR) within the sub-Groups vs. AVC Annual SR (orange bar) vs. BIOL Annual SR (dotted line)

Subject	Student Demographics	2022-2023		
		Subject vs. AVC Success Rate	PPG	# of completers needed to close the gap
BIOL	19 or Less	64.5% / 66.9%	-8.1%	139
	20-24	66.3%	-6.3%	105
	25-29	69.2%	-3.4%	17
	30-34	70.3%	-2.3%	8
	35-39	74.9%	2.3%	
	40-49	75.0%	2.4%	
	50+	71.7%	-0.9%	1

In 2022-2023, BIOL's Success Rate was 66.9% vs. AVC's Annual rate of 72.6%

Overall Disproportionate Impact as percentage point gap was : -5.7%

In BIOL, 4,599 was the enrollment count (duplicated headcount) (only shows if $n > 10$)

If there is a Disproportionate impact (PPG is negative), multiply the absolute value of PPG by the number of students and divide it by 100 to determine how many more successful completers would eliminate the gap.

(For example, (4,599 * |-5.7%|)=261. it means that 261 more successful course completers would help close the gap for this subject area)

(Hover over each bar in the chart to see details about each sub-group)

Some possible questions to ask when looking at the DI data:

- What are the potential reasons for equity gaps?
- What can my program implement to mitigate these gaps?
- What resources are available to support these efforts?

Division/Area Name: **MSE/Chemistry**	For Planning Years: **2024-2025**
Name of person leading this review:	
Names of all participants in this review: Harper, Schroer, Hernandez, Cheewawisuttichai	

Part 1. Program Overview: *Briefly describe how the program contributes to the district* **mission**

The chemistry program contributes to the district mission by supporting a diverse student population and their learning needs. For some, the chemistry courses are prerequisites for the nursing program, and many nurses stay in the community to work. Chemistry is also a prerequisite for various biology courses, Engineering, kinesiology courses. Students in chemistry classes complete the AS-T Chemistry, LAS-Math and Sciences, or Physical Sciences degrees.

Part 2A: Analyze the program review data (retrieval instructions), including equity data and any internal/external environmental scan information (e.g., surveys, interviews, focus groups, advisory groups, licensure exam scores, & job placement) to identify the program Strengths, Opportunities & Aspirations:

Use the following questions to guide your analysis:
Overall (Use the *Program Review* tab to inform your analysis)
- What are the success and retention rates (S&R) for your discipline? Did they decrease or increase in the last year?
- What are the trends for the number of awards granted? Are the number of awards going up or down?

Equity (Use the *S & R by Demographic Group* or the *Equity* tab to inform your analysis)
- Which racial/ethnic student groups complete their courses at the highest rates?
- Which racial/ethnic student groups experience the largest gaps when compared to the highest-performing group? Analyze the trends across the last review period. If no equity gaps are present, please reflect on the strategies that are working in the *Strengths and Accomplishments* section.

Strengths and Accomplishments: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*

Consider the following questions:
- *What does your program/area do well, including capabilities and greatest accomplishments?*
- *What are the practices that were implemented to increase success and retention rates or program awards?*

We successfully hired an outstanding full-time faculty with organic chemistry expertise.

Anecdotal reports from returning students always note that their learning experience at AVC exceeds what they encounter at UC and CSU campuses due to small class size, high standards, and resources provided.

Although overall success rates decreased relative to last year, a bright spot was the increase in success rates for African American/Black chemistry students. Last year was 47.9%, this year 56.9%. Students in the "Other" category increased their success from 65.3% to 77.9%.

Opportunities and Challenges: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*

Consider the following questions:
- *What does your program/area need to do better to support/improve student success?*

Improve labs for CHEM 110 -- incorporate foundational activities (such as using computers, balances, identifying glassware, etc.) into the first day of class, which has traditionally been only for safety training and check in.

Continue to publicize Basic Needs, Books Help, Financial Aid, campus jobs, First Year Experience (FYE), Umoja, Puente, and other support programs (include in syllabus, currently just announcements) to make sure all students have equal access.

Encourage and support students who want to tutor in Chemistry, so that the Learning Center can continue to provide the tutors and supplemental instructors that are so desperately needed.

FTES in chemistry dropped by approximately 5% due to cancellation of fully enrolled classes. Instructors were not available. We lost two adjunct instructors and are still short of one full-time faculty member. The need for additional adjunct instructors is extreme. Instead of expanding Palmdale offerings, we have had to cut them. Current instructors are overwhelmed with overload, unable to provide the quality of instruction with a more manageable load.

We have also lost the evening/weekend lab tech. That support would help relieve some of the burden on professors at those times.

Student aides are needed to clean the labs. Available resources are not being efficiently utilized.

There are multiple classes on evenings, Friday afternoons/evenings, and all-day Saturday, yet there is little to no support for students enrolled in these courses. With the push to increase offerings during nights and weekends, support for these students must be offered.

The success of students in the chemistry department is only 64.0% compared to the overall AVC success rate of 72.6%. The faculty feel this is due to lack of preparation. The advisory for students to take CHEM 101 (Introductory chemistry) prior to enrolling in CHEM 110 (general chemistry/majors' course) is frequently disregarded by students and their counselors. The math prerequisite of "Math 102 or placement by multiple measures" for Chem 110 may not be well understood as an Intermediate Algebra prerequisite, so that needs to be changed to align with the current accepted language congruent with AB 705/AB 1705. Although CHEM 120 (second semester of general chemistry) requires additional math skills, the prerequisite is the same as Chem 101 and 110. It seems that students who have had Intermediate Algebra are not exposed to logarithms, graphing, and interpreting mathematical data.

Aspirations: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*

Consider the following questions:
- *What does your program/area want to be known for?*
- *What is a desired future?*

In an attempt to help unprepared students, chemistry instructors are trying to build in more math support. Faculty are brainstorming ways to work with the Learning Center specialists to organize modules targeting specific math skills. Because invitations for students to attend tutoring and supplemental instruction (SI) are often ignored by the students who most need it, a strategy to get more students to participate is needed as well. We welcome any and all suggestions.

We want to further promote the AS degree in chemistry, which we feel will prepare our students by instilling crucial laboratory skills which in turn will help students excel in university chemistry programs. We want to continue to expose students to research grade equipment and explore opportunities for undergraduate

research. We will continue to prepare students to handle the level of rigor that they may face in nursing programs. We have successfully placed students with employers in the community and want to continue to find other opportunities that we can offer our students.

Part 2B: (Required for CTE) External Data: Advisory Committee Recommendations & Labor Market Data

Insert Advisory Committee Recommendations here (Please do not insert complete meeting minutes, but just recommendations from the advisory committee.)

Insert Labor Market Data here https://www.labormarketinfo.edd.ca.gov/commcolleges/

Part 2C: Review and comment on progress toward past Course Improvement Plans

List your past **Course Improvement Plans** (CIP) and progress toward meeting those plans.

Past Course Improvement Plans	Progress Made
Make supplemental instructors available. Because this is so difficult to find a suitable student for this position for CHEM 102 a tutor from outside of the college should be considered.	Most classes have supplemental instructors. (CHEM 102 and CHEM 220 are exceptions due to the smaller pool of students to pull from.)
Get students used to working in hands-on lab	Labs are being updated to expose students to more hands-on activities.
Need to meet CHEM 120 SLO. Because the CHEM 120 SLOs depend on foundational knowledge from CHEM 110, we should try to coordinate more to ensure that foundation is there.	Department meetings on Fridays enable a few faculty to meet between classes to discuss continuity and arising issues.
CHEM 110 and 120 students often do not have strong enough math skills to support their understanding of chemistry concepts.	Making better use of the math learning specialist resources is planned. Communication has already led to development of workshops on specific topics (metric prefixes, conversion factors, graphing, logarithms...)
The current faculty are finding it difficult to cover all of the classes in the schedule.	Reaching out to former students, community partners, and others who could help recruit adjunct faculty.

Part 2D: Review and comment on progress towards past program review goals:

List your past program review goals and progress towards those goals.

Past Goal	Progress Made
Hire additional full-time faculty and increase the adjunct pool.	Negative Progress. Two adjunct instructors were lost and one full time position to replace a retirement has still not been approved.
Increase the number of AS-T chemistry awards by 15%	Negative Progress. The AS-T chemistry has been eliminated due to unit limitations per the chancellor's office. A local AS in chemistry has been drafted.
Increase undergraduate participation by 15%.	No progress. Faculty is too stretched with overload to take on outside activities.

Part 3: Based on Part 2 above, please list program/area goals for 2023-2024:								
Program /Area Goal #	Goal Supports which:				ESP Goal Primarily Supported:	Goal (Student-focused)	Steps to be taken to achieve the goal?	Measure of Success (How would you know you've achieved your goal?)
	ILO	PLO	SLO	OO				
#1	ILO 4. Career and Specialized Knowledge	AS CHEM PLO #1	CHEM 110, 120, 210, 220 SLO #1		Goal 5: Align instructional programs to the skills identified by the labor market	To improve student success by incorporating more hands-on activities and instrumentation in the lab classes.	Training for instructors, ensuring adequate supplies for students in lab.	Students successfully exceed lab SLO in all courses.
#2	ILO 2. Creative, Critical, and Analytical Thinking		CHEM 110, 120, 210, 220 SLO #2		Goal 2: Increase efficient and effective use of resources: Technology; Facilities; Human Resources; Business Services	To improve student retention by working more closely with the learning center.	Coordinate with math learning specialists.	SLO improvement in all courses.
#3	Choose ILO				Choose an item.☐			
#4	Choose ILO				Choose an item.			

Part 4: Resource Requests that Support Program Goals (Based on the above analysis, please use the following space to document resource requests)

Type of Resource Request	Summary of Request	Which of your Program/area goals (Part 3) does this request support?	New or Repeat Request	Amount of Request, ($)	One-Time or Recurring Cost, ($)	Contact's Name
Faculty	Hire additional full-time faculty and increase the adjunct pool.	Goal #1 and Goal #2	Repeat	$100,000	Recurring	Jedidiah Lobos and Alexandra Schroer
Supplies	Additional budget for lab supplies is essential to ensure enough materials for all students	Goal #1	Repeat	$100,000	Recurring	Jedidiah Lobos, Alexandra Schroer
Professional development	More training on undergraduate research design and instrumentation to achieve our goal of expanding research opportunities for students	Goal #1	Repeat	$50,000	Recurring	Jessica Harper
Classified Staff	Hire a technician to cover night classes/weekends	Goal #1	New	$30000-$60000	Recurring	Jedidiah Lobos and Alexandra Schroer
Choose an item.			Choose an item.		Choose an item.	

***REQUIRED: After gathering the information above, fill out your RESOURCE REQUESTS to be shared with the Budget Committee:**
https://www.surveymonkey.com/r/2023PR_ResourceRequest

Part 5: Insert your Program Review Data here and any other supporting data. (See Part 2A above).
Required:
- Program Review tab
- S&R by Demographic Groups tab

Optional:
- Other supporting data/information

Please Select **Subject** area (twice) and **Program Major(s)** to get your data -->

Select Subject	Select Subject again	Select Program Major(s)	Academic Year
CHEM	CHEM	AS-T Chemistry (CHMT)	Multiple values

Retention, Success, Number of Sections, & Enrollment in CHEM (Total AVC rates are shown as │ *hover over to see data*)

CHEM	Subject vs. AVC Retention Rate	Subject vs. AVC Success Rate	# of Sections	Enrollment (Dupl.), no EWs
2019-2020	85.7%	72.1%	68	1,503
2020-2021	83.7%	67.2%	64	1,496
2021-2022	84.2%	64.6%	66	1,480
2022-2023	83.3%	64.0%	63	1,423

Enrollment and Number of Sections by *Modality* in CHEM

	Instr. Method	2019-2020	2020-2021	2021-2022	2022-2023
Number of Sections	Traditional	68	64	66	63
Enrollment	Traditional	1,556	1,498	1,482	1,425

Enrollment and Number of Sections by *Location* in CHEM

	Location	2019-2020	2020-2021	2021-2022	2022-2023
Number of Sections	Lancaster	65	61	62	59
	Palmdale	3	3	4	4
Enrollment	Lancaster	1,484	1,433	1,394	1,350
	Palmdale	72	65	88	75

Number of Program Awards in AS-T Chemistry (CHMT)

Major Desc (Code)	Deg./Cert.	Academic Year	Number of Awards
AS-T Chemistry (CHMT)	Degree	2019-2020	19 / AS
		2020-2021	22 / AS
		2021-2022	23 / AS
		2022-2023	21 / AS

FTEF by Contract Type, Part-time/Full-time Ratio, FTES, FTES/FTEF in CHEM

	Fall 2019	Fall 2020	Fall 2021	Fall 2022
PT (Adjunct) FTEF	5	5	5	5
FT (Regular) FTEF	4	6	5	5
FT (Overload) FTEF	3	2	2	2
TOTAL FTEF	12	12	11	11
PT/FT FTEF Ratio	1	1	1	1
FTES	165	164	153	146
FTES/FTEF Ratio	14	14	13	13
WSCH/FTEF Ratio	419	406	404	396
WSCH	4,947	4,914	4,584	

Click here
to see AVC's Program awards dashboard

Last Update: 09/30/2022 .Data Sources: AVC's Banner, ARGOS reports

Subject-Level Retention Rate (RR), Success Rate (SR), and Enrollment by Sex & Race/Ethnicity as Compared to AVC's Rates (|)

If the Subject bars are below the vertical lines | , it indicates that equity gaps exist in SR or RR for those sub-groups as compared to overall SS or RR. Some questions to ask when looking at the data:
- What are the potential reasons for equity gaps? - What can my program implement to mitigate these gaps? (Consider such factors as curriculum design, teaching methods, camp climate, and support services.) - What resources/training are available/needed to support these efforts?

			Subject vs. AVC Retention Rate |	Subject vs. AVC Success Rate |	Enrollment
CHEM	B	2020-2021			
		2021-2022			
		2022-2023			
	Female	2019-2020	84.5%	70.1%	963
		2020-2021	84.0%	67.2%	1,036
		2021-2022	84.1%	63.7%	928
		2022-2023	84.1%	64.5%	944
	Male	2019-2020	87.4%	75.2%	524
		2020-2021	83.3%	67.9%	449
		2021-2022	84.6%	65.9%	534
		2022-2023	81.3%	62.5%	461
	Unknown/Oth..	2019-2020	100.0%	87.5%	16
		2020-2021			
		2021-2022	81.3%	75.0%	16
		2022-2023	85.7%	71.4%	14
CHEM	Hispanic/Latinx	2019-2020	85.6%	70.1%	895
		2020-2021	83.2%	65.6%	969
		2021-2022	84.8%	64.3%	948
		2022-2023	83.9%	61.3%	956
	African American/Black	2019-2020	81.6%	64.0%	125
		2020-2021	80.6%	53.8%	93
		2021-2022	77.3%	47.9%	119
		2022-2023	75.5%	56.9%	102
	White Non-Hispanic	2019-2020	88.0%	78.1%	274
		2020-2021	84.2%	72.2%	241
		2021-2022	87.1%	74.7%	241
		2022-2023	85.0%	73.5%	200
	Two or more races	2019-2020	87.7%	76.7%	73
		2020-2021	78.2%	60.0%	55
		2021-2022	78.6%	58.9%	56
		2022-2023	77.0%	63.9%	61
	Other	2019-2020	84.6%	77.9%	136
		2020-2021	90.6%	81.2%	138
		2021-2022	82.8%	65.5%	116
		2022-2023	85.6%	77.9%	104

Academic Year Slider

Click to Include EWs

2022-2023 Disproportionate Impact (DI) as Percentage Point Gap (PPG)

Blue Bars show Success Rate (SR) within the sub-Groups vs. **AVC Annual SR (orange bar)** vs. **CHEM** Annual SR (dotted line)

Subject	Student Demographics ..	Subject vs. AVC Success Rate	PPG	# of completers needed to close the gap
CHEM	19 or Less	59.1% / 64.0%	-13.5%	78
	20-24	66.9%	-5.7%	31
	25-29	66.9%	-5.7%	8
	30-34	67.0%	-5.6%	5
	35-39	74.2%	1.6%	
	40-49	71.4%	-1.2%	0
	50+			

2022-2023

In 2022-2023, CHEM's Success Rate was 64.0% vs. AVC's Annual rate of 72.6%

Overall Disproportionate Impact as percentage point gap was : -8.6%

In CHEM, 1,423 was the enrollment count (duplicated headcount) (only shows if $n > 10$)

If there is a Disproportionate impact (**PPG is negative**) , multiply the absolute value of PPG by the number of students and divide it by 100 to determine how many more successful completers would eliminate the gap.

(For example, (1,423 * |-8.6%|)=**122**. it means that 122 more successful course completers would help close the gap for this subject area)

(Hover over each bar in the chart to see details about each sub-group)
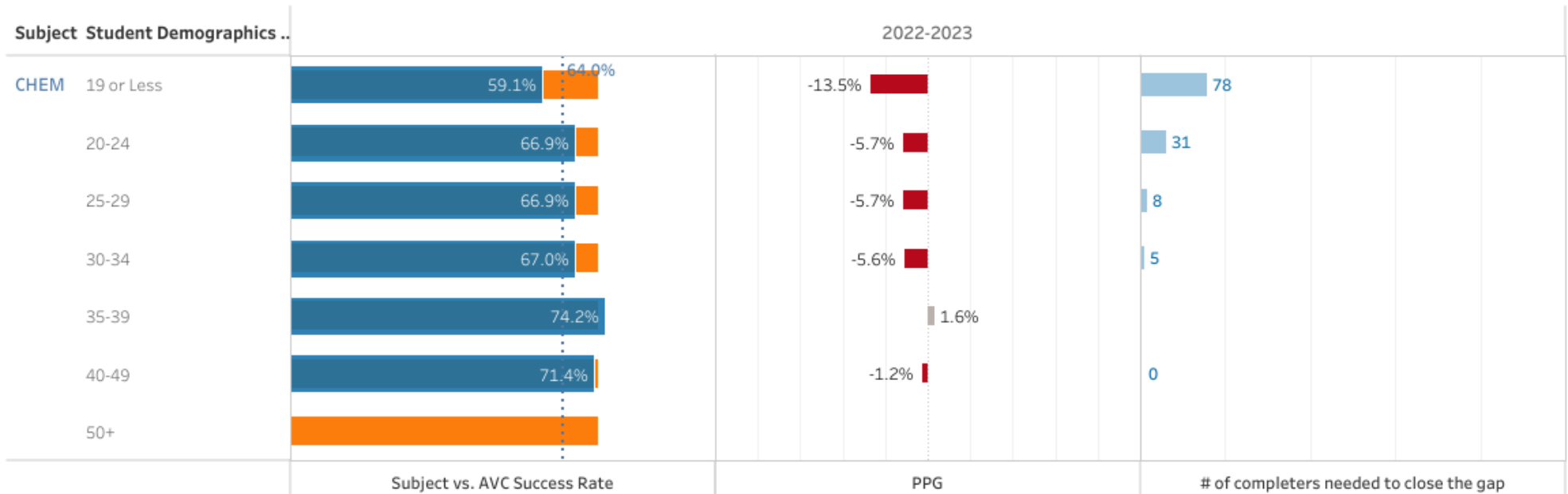
Some possible questions to ask when looking at the DI data:

- What are the potential reasons for equity gaps?

- What can my program implement to mitigate these gaps?

- What resources are available to support these efforts?

Fall 2023 Program Review Report

Division/Area Name: Math, Science, and Engineering Division – Computer Science	For Planning Years: 2024-2025
Name of person leading this review: Richard Biritwum	
Names of all participants in this review: Jedidiah Lobos	

Part 1. Program Overview: *Briefly describe how the program contributes to the district mission*

The AVC Computer Science program continues to play a pivotal role in attracting, retaining, and graduating/transferring students in engineering majors that are so highly sought after by the local aerospace and manufacturing industry. The AVC Computer Science student population is very diverse, closely resembling the overall area demographics.

The faculty and staff of the Computer Science and Business & Computer Studies Department are dedicated to providing students with hands-on training required for skill certification, continuing education classes, professional development, and the opportunity to learn the fundamentals necessary to be well-educated in a discipline. Courses are provided for students who wish to complete a two-year degree or certificate, transfer to a four-year university, enter the business workforce, or simply upgrade or upskill. The Computer Science program specifically contributes to the district mission by supporting:
1) students seeking technical software development education,
2) development of analytical skills with a solid foundation in several programming
   languages to enter the professional workforce (Software Development Associate and Certificate), and finally,
3) students seeking to transfer to a four-year University.

Part 2A: Analyze the program review data ([retrieval instructions](#)), including equity data and any internal/external environmental scan information (e.g., surveys, interviews, focus groups, advisory groups, licensure exam scores, & job placement) to identify the program Strengths, Opportunities & Aspirations:

Use the following questions to guide your analysis:
Overall (Use the *Program Review* tab to inform your analysis)
- **What are the success and retention rates (S&R) for your discipline? Did they decrease or increase in the last year?**
- **What are the trends for the number of awards granted? Are the number of awards going up or down?**
Equity (Use the *S & R by Demographic Group* or the *Equity* tab to inform your analysis)
- **Which racial/ethnic student groups complete their courses at the highest rates**?
- **Which racial/ethnic student groups experience the largest gaps when compared to the highest-performing group**? Analyze the trends across the last review period. If no equity gaps are present, please reflect on the strategies that are working in the *Strengths and Accomplishments* section.

Strengths and Accomplishments: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*

Consider the following questions:
- What does your program/area do well, including capabilities and greatest accomplishments?
- What are the practices that were implemented to increase success and retention rates or program awards?

The AS-T Computer Science degree jumped to 19% in 2022-2023, from a low of 7% in 2021-2022, a remarkable increase. The number of degree awards were going up from 2021-2022 and that can be explained by the sharp increase in enrollment across the board, after the COVID19 restrictions were lifted. The incremental increases were seen in the AVC Local Certificate and the AS-T degrees, and we anticipate an upward trend going into 2023-2024 school year.

Opportunities and Challenges: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*

Consider the following questions:
- What does your program/area need to do better to support/improve student success?
- What actions can be taken to help close equity gaps?

Despite the COVID-19 stay-at-home order in 2021-2022, online classes did better than in-person classes. While both modalities were successful, in 2022-2023, our Program Awards for certificates and degrees fell by 20% from 1,348 to 1,155. This could be attributed to students getting accustomed to in-person learning, after having to learn online for about a year. This group of students comprised of those who began their college career in-person and then adapt to the online environment, as well as those who spent their last year in high school online. In both cases, the change in modality may have played a part in the success rates seen since. Having gone through the challenges of trying to adapt our courses to the online environment and succeeding in doing so, we are confident that students who now prefer the online environment and have adapted to it can succeed using that modality.

The success and retention rates of the Computer Science program were a "mixed bag". Regarding student enrollment, we increased our enrollment of African American/Black and LatinX students, however several did not stay, therefore lowing our retention rates. The retention rate was not that different from the year prior, however, coming in at 83% as opposed to 84%.

In 2022-2023, there was a large disparity in the enrollment numbers of (reported) males (607) versus the number of (reported) females (170). While national statistics (according to the National Science Foundation) parallel what we experience here with an underrepresentation of women in Computer Science, it gives us the opportunity to develop strategies to see if we can narrow the enrollment gap.

Aspirations: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*

Consider the following questions:
- What does your program/area want to be known for?
- What is a desired future?

In the next year, we hope to develop marketing strategies to increase awareness of the career opportunities associated with computer science. By doing so, we hope to see an even larger demand in the number of enrollees. We also want to aim much of our efforts to those who are underrepresented in computer science. We plan on increasing our outreach efforts to local area high schools and potentially middle schools to give an idea of what computer science has to offer.

Part 2B: (Required for CTE) External Data: Advisory Committee Recommendations & Labor Market Data

Insert Advisory Committee Recommendations here (Please do not insert complete meeting minutes, but just recommendations from the advisory committee.)

NONE AVAILABLE

Insert Labor Market Data here https://www.labormarketinfo.edd.ca.gov/commcolleges/

Projections of Employment by Occupation, 2018 - 2028

Occupations Matched to Top Code(s):

070600   *Computer Science (transfer)*

Geography: California

Counties: All California Counties

Annual Job Openings by Occupation

SOC Code	Occupation Title (Link to Occupation Profile)	2018 Employment	Annual Job Openings[1]
151131	Computer Programmers	22,200	13,270
151132	Software Developers, Applications	123,400	135,330
151133	Software Developers, Systems Software	69,500	60,160
	Total	215,100	208,760

Table Generated on 9/26/2023 5:24:39 PM

[1]Total Job Openings are the sum of new jobs from growth plus net replacements. Annual job openings are total job openings divided by the number of years in the projection period.

[2]This occupation has been suppressed due to confidentiality.

Part 2C: Review and comment on progress toward past Course Improvement Plans

List your past **Course Improvement Plans** (CIP) and progress toward meeting those plans.

In 2022-2023, the areas of serious concern were increasing the enrollment numbers and improving success rates across all CS courses. Obviously, the Coronavirus pandemic was in the rear window, but all courses in CS showed low attendance rates, which dropped to as low as 30%, as students seemed reluctant to taking face to face classes for fear of infections. A high number of students were not vaccinated and/or unwilling to do so. The need for a new CS faculty member continued to receive major support from the Administration, and as interviews were held to identify potential candidates the urgency was not very high, but the need to prepare for a surge of high enrollment was always there.

Past Course Improvement Plans	Progress Made
Review current CIS 101 textbook for replacement	No change was made, due to consensus among faculty to keep textbook
Increase enrollment across disciplines	No progress made, and enrollment actually dropped as we saw students pursue job opportunities after COVID-19, to improve their families' financial situations.
Improve Course/Program success rate	No progress made, as the fall in enrollment also impacted student success due to the students' inability to focus and adapt to distance education.
Adding Prerequisites to CS 121, CS 123	No progress made with this Action Plan, due to State requirements to keep existing Advisory status for both courses, despite being the courses with the lowest rates of success (below 50% pass rate).

Part 2D: Review and comment on progress towards past program review goals:

List your past program review goals and progress towards those goals.

Past Goal	Progress Made
Hire a new full time faculty for Computer Science	Funding was provided for the position and attempts were made to identify a number of capable candidates to be interviewed. It ended with the successful hiring of a new full time faculty member for Computer Science.
Increasing class size for all CS courses	As of yet, the process of putting the courses through the course revision process has not been started. While there are currently computer lab spaces that will accommodate larger classes, class size maximums need to be updated appropriately.
Increase in student success in Computer Science	For the 2022–2023 academic year, the success rate may have decreased due to students continuing to struggle with the different modalities offered. Especially with online classes, there is an intense requirement that involves a great amount of student commitment, focus, and time management to meet the tough computer programming assignments, projects, and Labs.
Increase in female and minoritized students in Computer Science courses	The data does not really show a significant increase in the number of female and minoritized students in the computer science courses. More work needs to be done in order to lead to significant increases for these two student populations.

Part 3: Based on Part 2 above, please list program/area goals for 2023-2024:

Program /Area Goal #	Goal Supports which: ILO	PLO	SLO	OO	EMP Goal Primarily Supported:	Description of Goal	Steps to be taken to achieve goal?	Measure of Success (How would you know you've achieved your goal?)
#1	ILO 2. Creative, Critical, and Analytical Thinking	All	All		Goal 1: Commitment to strengthening institutional effectiveness measures and practices	Narrow the gap in enrollment for our female students as well as narrow the gap in the success rates for our African American/Black and LatinX students.	Increase outreach and marketing efforts and assist the Learning Center in recruiting more peer tutors to provide assistance to students.	Look at retention and success rate data.

Look at enrollment numbers across different constituent groups. |
| #2 | ILO 4. Career and Specialized Knowledge | All | All | | Goal 5: Align instructional programs to the skills identified by the labor market | To continue to help a greater number of AVC students transfer to 4-year institutions and join the workforce. | During lectures and projects, faculty will continue to offer innovative lectures using state-of-the-art equipment while enforcing the benefits of pursuing a transfer degree.

Faculty will continue to provide academic and career mentorship to students. | Examine transfer degree data for AS-T Computer Science. |
| #3 | Choose ILO | | | | Choose an item. | | | |

Part 4: Resource Requests that Support Program Goals (Based on the above analysis, please use the following space to document resource requests)

Type of Resource Request	Summary of Request	Which of your Program/area goals (Part 3) does this request support?	New or Repeat Request	Amount of Request, ($)	One-Time or Recurring Cost, ($)	Contact's Name
Faculty	Additional Adjunct Instructors needed	#1 and #2	Repeat	Variable	Recurring	Richard Biritwum, Jedidiah Lobos
Physical/Facilities	None	None	Repeat	$0	Recurring	
Technology	Interactive Whiteboards	#2	Repeat	$15,000	One-time	Richard Biritwum
Supplies	None	None	Choose an item.	$0	Choose an item.	
Choose an item.			Choose an item.		Choose an item.	

***REQUIRED: After gathering the information above, fill out your RESOURCE REQUESTS to be shared with the Budget Committee:

https://www.surveymonkey.com/r/2023PR_ResourceRequest

Part 5: Insert your Program Review Data here and any other supporting data. (See Part 2A above).
Required:
- Program Review tab
- S&R by Demographic Groups tab

Optional:
- Other supporting data/information

Select Subject	Select Subject again	Select Program Major(s)	Academic Year
CIS	CIS	AS-T Computer Science (COSC)	Multiple values

Retention, Success, Number of Sections, & Enrollment in CIS (Total AVC rates are shown as | *hover over to see data*)

CIS				
2021-2022	83.6%	70.1%	39	715
2022-2023	82.9%	70.5%	36	790
	Subject vs. AVC Retention Rate	Subject vs. AVC Success Rate	# of Sections	Enrollment (Dupl.), no EWs

Enrollment and Number of Sections by *Modality* in CIS

	Instr. Method	2021-2022	2022-2023
Number of Sections	Online	5	10
	Other Indep Study	2	1
	Traditional	32	25
Enrollment	Online	329	215
	Other Indep Study	3	1
	Traditional	384	574

Enrollment and Number of Sections by *Location* in CIS

	Location	2021-2022	2022-2023
Number of Sections	Lancaster	32	23
	Palmdale	7	13
Enrollment	Lancaster	371	519
	Palmdale	345	271

Number of Program Awards in AS-T Computer Science (COSC)

Major Desc (Code)	Deg. /Cert.	Academic Year	
AS-T Computer Science (COSC)	Degree	2021-2022	7 / AS
		2022-2023	19 / AS

Number of Awards

FTEF by Contract Type, Part-time/Full-time Ratio, FTES, FTES/FTEF in CIS

	Fall 2019	Fall 2020	Fall 2021	Fall 2022
PT (Adjunct) FTEF	3	3	3	2
FT (Regular) FTEF	2	2	1	1
FT (Overload) FTEF	1	1	1	1
TOTAL FTEF	6	6	5	4
PT/FT FTEF Ratio	2	1	3	2
FTES	62	59	36	43
FTES/FTEF Ratio	10	10	7	10
WSCH/FTEF Ratio	309	304	215	304
WSCH	1,874	1,766	1,077	

Click here
to see AVC's Program
awards dashboard

Last Update: 09/30/2022 .Data Sources: AVC's Banner, ARGOS reports

Subject-Level Retention Rate (RR), Success Rate (SR), and Enrollment by Sex & Race/Ethnicity as Compared to AVC's Rates (|)

If the Subject bars are below the vertical lines | , it indicates that equity gaps exist in SR or RR for those sub-groups as compared to overall SS or RR. Some questions to ask when looking at the data:
- What are the potential reasons for equity gaps? - What can my program implement to mitigate these gaps? (Consider such factors as curriculum design, teaching methods, campus climate, and support services.) - What resources/training are available/needed to support these efforts?

			Subject vs. AVC Retention Rate	Subject vs. AVC Success Rate	Enrollment
CIS	Female	2021-2022	81.4%	71.3%	188
		2022-2023	81.8%	67.1%	170
	Male	2021-2022	84.4%	69.3%	512
		2022-2023	82.9%	71.2%	607
	Unknown/Oth..	2021-2022	86.7%	80.0%	15
		2022-2023	100.0%	84.6%	13
CIS	Hispanic/Latinx	2019-2020	84.6%	72.8%	540
		2020-2021	83.4%	66.4%	512
		2021-2022	85.2%	69.9%	386
		2022-2023	79.8%	65.7%	481
	African American/Black	2019-2020	85.3%	62.1%	95
		2020-2021	82.7%	63.0%	81
		2021-2022	72.0%	48.0%	75
		2022-2023	76.7%	58.3%	60
	White Non-Hispanic	2019-2020	91.4%	83.3%	221
		2020-2021	88.2%	78.5%	186
		2021-2022	87.0%	82.1%	162
		2022-2023	88.6%	81.3%	123
	Two or more races	2019-2020	89.4%	71.2%	66
		2020-2021	89.4%	74.5%	47
		2021-2022	74.4%	53.8%	39
		2022-2023	88.5%	80.8%	52
	Other	2019-2020	86.9%	76.2%	122
		2020-2021	86.7%	80.6%	98
		2021-2022	84.9%	77.4%	53
		2022-2023	94.6%	86.5%	74

Academic Year Slider

Click to Include EWs

2022-2023 Disproportionate Impact (DI) as Percentage Point Gap (PPG)

Blue Bars show Success Rate (SR) within the sub-Groups vs. AVC Annual SR (orange bar) vs. CIS Annual SR (dotted line)

Subject	Student Demographics ..	Subject vs. AVC Success Rate	PPG	# of completers needed to close the gap
CIS	19 or Less	70.3% / 70.5%	-2.3%	6
	20-24	74.1%	1.5%	
	25-29	56.2%	-16.4%	12
	30-34	70.3%	-2.3%	1
	35-39	68.2%	-4.4%	1
	40-49	60.0%	-12.6%	2
	50+			

In 2022-2023, CIS's Success Rate was 70.5% vs. AVC's Annual rate of 72.6%

Overall Disproportionate Impact as percentage point gap was : -2.1%

In CIS, 790 was the enrollment count (duplicated headcount) (only shows if $n > 10$)

If there is a Disproportionate impact (**PPG is negative**) , multiply the absolute value of PPG by the number of students and divide it by 100 to determine how many more successful completers would eliminate the gap.

(For example, (790 * |-2.1%|)=**17**. it means that 17 more successful course completers would help close the gap for this subject area)

(Hover over each bar in the chart to see details about each sub-group)

Some possible questions to ask when looking at the DI data:

- What are the potential reasons for equity gaps?
- What can my program implement to mitigate these gaps?
- What resources are available to support these efforts?

Grade Distribution for CIS based on all enrolled students, including those who received "EW"s during Spring 2020
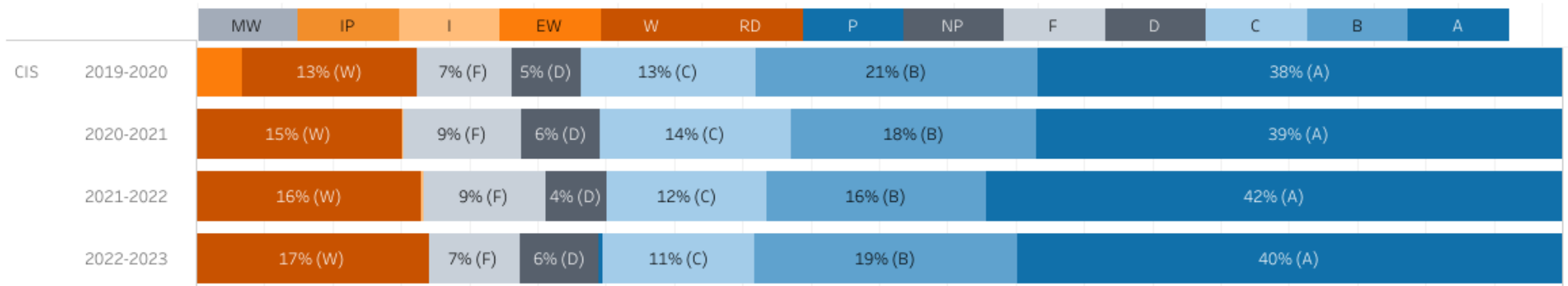
		MW	IP	I	EW	W	RD	P	NP	F	D	C	B	A

CIS	2019-2020	13% (W)	7% (F)	5% (D)	13% (C)	21% (B)	38% (A)
	2020-2021	15% (W)	9% (F)	6% (D)	14% (C)	18% (B)	39% (A)
	2021-2022	16% (W)	9% (F)	4% (D)	12% (C)	16% (B)	42% (A)
	2022-2023	17% (W)	7% (F)	6% (D)	11% (C)	19% (B)	40% (A)

CIS (only shows if n >10)

Minor variation in numbers might occur due to rounding

Subject		A, B, C & P	D & F	W	I, IP, RD	EW

With "EW"s

Year	A,B,C&P	D&F	W	EW
2018-2019	75.7%	10.2%	14.0%	
2019-2020	71.9%	11.9%	12.9%	3.3%
2020-2021	70.5%	14.4%	15.0%	
2021-2022	70.0%	13.4%	16.3%	

Without "EW"s

Year	A,B,C&P	D&F	W
2018-2019	75.7%	10.2%	14.0%
2019-2020	74.3%	12.4%	13.3%
2020-2021	70.5%	14.4%	15.0%
2021-2022	70.1%	13.4%	16.4%

![Antelope Valley College logo]

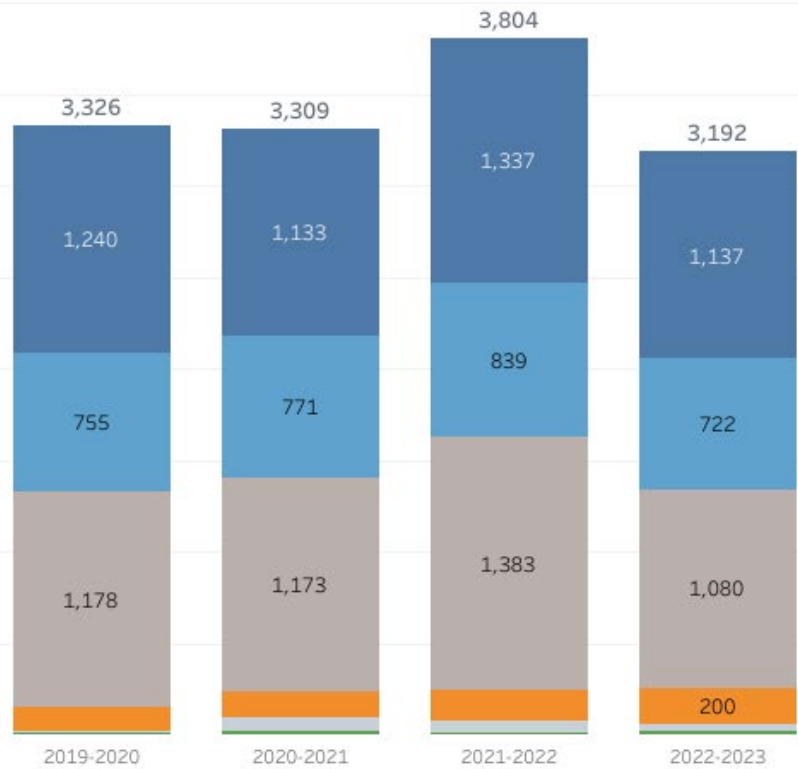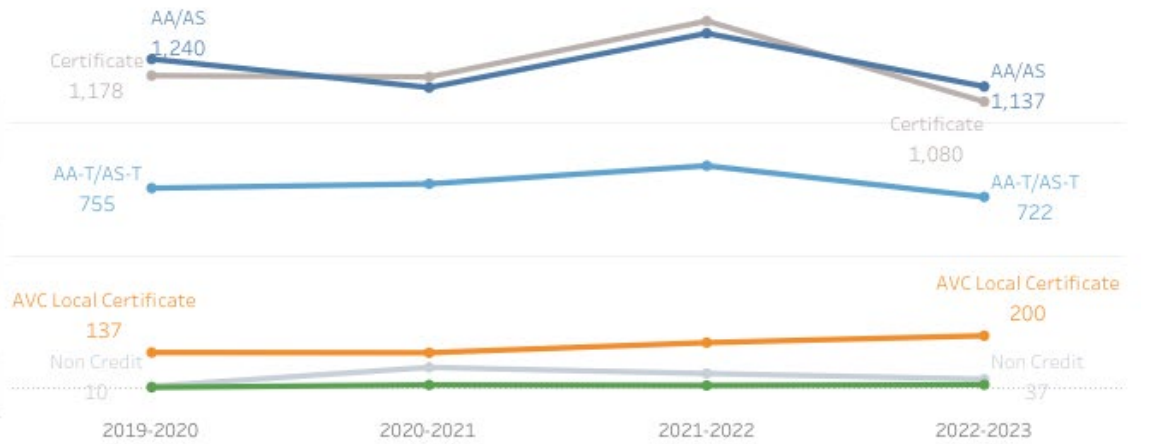**Program Awards** (Last update: **8/7/23**; Data Source: *AVC Banner System*) Click on any field to filter data

Major: Multiple val.. | Award: All | AY: Multiple valu..

	2019-2020	2020-2021	2021-2022	2022-2023
AA/AS	1,274	1,144	1,348	1,155
AA-T/AS-T	774	772	850	735
Certificate	1,189	1,180	1,400	1,099
AVC Local Certificate	140	138	177	200
Bachelor's	6	15	13	16
Non Credit	10	81	58	37
Total	3,393	3,330	3,846	3,242

Line chart:
- AA/AS: 1,240 (2019-2020) → 1,137 (2022-2023)
- Certificate: 1,178 (2019-2020) → 1,080 (2022-2023)
- AA-T/AS-T: 755 (2019-2020) → 722 (2022-2023)
- AVC Local Certificate: 137 (2019-2020) → 200 (2022-2023)
- Non Credit: 10 (2019-2020) → 37 (2022-2023)

Stacked bar chart:
- 2019-2020: Total 3,326 — 1,240 / 755 / 1,178
- 2020-2021: Total 3,309 — 1,133 / 771 / 1,173
- 2021-2022: Total 3,804 — 1,337 / 839 / 1,383
- 2022-2023: Total 3,192 — 1,137 / 722 / 1,080 / 200

Major	Degree or Certif..	2019-2020	2021-2022	2022-2023
Bus Computer Info Science| CIS	AA/AS	2	4	4
Bus Computer Info Sci Cert| CIS1	Certificate	2	4	4
AS-T Computer Science| COSC	AA-T/AS-T		7	19

Division/Area Name: Engineering	**For Planning Years: 2024-2025**

Name of person leading this review: Jonathan Compton (Faculty)

Names of all participants in this review: Tom Wang (Faculty)

Part 1. Program Overview: *Briefly describe how the program contributes to the district mission*

As a cornerstone of our institution's mission, our engineering program guides students toward successful graduation and transfer in high-demand engineering majors, which are particularly sought after by universities. The AVC engineering student population is very diverse, closely resembling the overall area demographics. In keeping up with a diverse population of learners, the Engineering department provides courses for not only Engineering students, but for the Career Technical Education division's AFAB/AFMT students as well. The Engineering department continues to promote equity by addressing gender, race/ethnicity, and age factors, which foster an inclusive educational environment aligned with our institution's core values and objectives.

Part 2A: Analyze the program review data (retrieval instructions), including equity data and any internal/external environmental scan information (e.g., surveys, interviews, focus groups, advisory groups, licensure exam scores, & job placement) to identify the program Strengths, Opportunities & Aspirations:

Use the following questions to guide your analysis:

Overall (Use the *Program Review* tab to inform your analysis)

- What are the success and retention rates (S&R) for your discipline? Did they decrease or increase in the last year?
- What are the trends for the number of awards granted? Are the number of awards going up or down?

Equity (Use the *S & R by Demographic Group* or the *Equity* tab to inform your analysis)

- Which racial/ethnic student groups complete their courses at the highest rates?
- Which racial/ethnic student groups experience the largest gaps when compared to the highest-performing group? Analyze the trends across the last review period. If no equity gaps are present, please reflect on the strategies that are working in the *Strengths and Accomplishments* section.

Strengths and Accomplishments: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*

In the 2022-2023 academic year, **ENGR's success rate was 75.6%**, while **AVC's annual success rate was 72.6%**. Moreover, the **retention rate of ENGR was 87.8%** versus **AVC's annual retention rate of 89.2%**. Both the success and retention rates in ENGR stayed about the same from the previous year.

As a department, ENGR had a very successful year in terms of success rates and retention rates. Engineering is one of the more demanding disciplines on campus and thus would be expected to have lower than average retention and success rates. However, this was not the case.

The department had **33 completions** for the 2022-2023 academic year. The **number of competitions increased by 65%** from the previous year.

Gender Gap

The department of **ENGR had 104 female students** (21.0%) **and 391 male students** (79.0%) enrolled during the 2022-2023 school year. The **retention rate of female students was 89.4%**, whereas the **retention rate of male students was 87.2%** (AVC's of 89.2%). The **success rate for females was 81.7%**, whereas the **success rate for males in the AVC was 73.7%** (AVC's of 72.6%).

The **ENGR department did not observe any gender gaps** based on retention or success. Overall, ENGR has been successful in maintaining a welcoming environment for female and male students alike.

Ethnicity/Race Gap

The department of ENGR served the following students in the 2022 - 2023 school year: **313 Hispanic/Latinx** (62.5%)**, 24 African American/Black** (4.8%)**, 99 White/Non Hispanic** (19.8%)**, 29 Two or more races** (5.8%)**, and 36 Other** (7.2%).

The **ENGR Retention Rates** for the given Ethnicity/Race groups are as follows: **86.9% for Hispanic/Latinx** (AVC's of 89.3%)**, 83.3% for African American/Black** (AVC's of 84.8%)**, 92.9% for White/Non Hispanic** (AVC's of 90.5%)**, 89.7% for Two or more races** (AVC's of 88.2%)**, and 83.3% for Other** (AVC's of 90.6%).

The **ENGR Success Rates** for the given Ethnicity/Race groups are as follows: **74.1% for Hispanic/Latinx** (AVC's of 72.9%)**, 45.8% for African American/Black** (AVC's of 61.5%)**, 86.9% for White/Non Hispanic** (AVC's of 79.0%)**, 86.2% for Two or more races** (AVC's of 72.7%)**, and 69.4% for Other** (AVC's of 80.1%).

The **ENGR department did observe a racial gap in terms of African American students**. While we only serve a small number of African American students, the success rate for them is quite low.

Opportunities and Challenges: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*

Challenges:

In the 2022- 2023 school year, the ENGR department had a total of 353 students (non-duplicated) enrolled, along with approximately 200 more students who had selected an ENGR degree as part of their educational plan. **The primary challenge facing the ENGR department remains guiding students through their prerequisites and successfully completing their ENGR courses to earn their degrees**.

Engineering remains one of the more difficult majors for counselors to plan for students. This is due to the number of fields in engineering and the fact that **there are challenges in articulation and requirements among all transfer universities.**

Another challenge for the ENGR department is the low enrollment of African American students and the observed racial gap based on success rate with current African American/Black students. Even though we saw an increase in the number of African American students of 100% from the previous year (12 to 24 students) our success rates declined.

Opportunities:

Although there has been an increase of 12 African American students from the previous year, there is still potential for substantial improvement in increasing the African American student population in ENGR. One promising avenue to explore is forging closer collaborations with local high schools to actively attract and guide more students toward pursuing engineering education and careers within local engineering industries. We can also offer support for our current African American students in ENGR, it's crucial to address both academic and socio-cultural aspects. We can collaborate with existing mentorship programs like A2MEND and Umoja to enhance students' study skills and academic discipline, while also strengthening their support network. These efforts will contribute to a more inclusive and empowering environment in engineering education. Additionally, focus on improving faculty sensitivity and cultural awareness to further support African American students.

With the introduction of the Mathematics, Engineering, Science Achievement (MESA) program in the following academic year, tutoring and mentorship initiatives will be made available for engineering students across the board. To enhance these programs, we can focus on improving peer-to-peer and faculty-to-peer mentoring initiatives, aiming to bolster the student success rate. Additionally, there's an opportunity to provide more effective academic tutoring programs, specifically tailored to engineering classes, to further support student achievement.

Aspirations: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*

The ENGR program at AVC wants to be known for two main traits: **Inclusivity** and **Preparation.**

Inclusivity

The Department of Engineering recognizes and fully embraces the diverse community around us. In our classrooms and as educators, we actively work to make everyone feel included. Our aim is to create a welcoming environment where students from all backgrounds can confidently enter our doors, knowing they are safe as they learn alongside faculty and fellow students. In addition, we are committed to improving our facilities to better serve our students. We've teamed up with Student Life (Books H.E.L.P.), the STEM grant, and ITS to provide vital resources like textbooks, lab materials, and computer access to students who need them, removing financial barriers to education. We're also thrilled to share that we're working on expanding and enhancing new rooms for our material laboratory and electrical engineering lab. This expansion will enrich the learning experience and ensure every student has access to top-notch resources they need for their academic journey. Our dedication is that no student should ever lack the resources they need to learn, and we're taking concrete steps to make sure of that. We're excited to introduce the new MESA (Mathematics, Engineering, and Science Achievement) program, which will further enhance the educational experience, promote academic excellence, and make sure every student has access to the resources they need for their academic journey.

<u>Preparation</u>

As a department, we are committed to ensuring that our students meet or exceed the standards of university-level instruction and hands-on technical engagement that are required of transfer students as they transition out of our Department and on to the next stage of their academic careers. Throughout all of our courses, we maintain a continuous dialogue with counselors, university faculty, and industry partners in order to customize each student's experience and provide a rigorous educational journey. Our Introduction to Engineering course prepares students for future coursework, offers guidance on engineering majors, and facilitates a smooth university transition. In subsequent courses, students gain progressively greater engineering expertise, ultimately achieving a level of proficiency equal to or exceeding their peers. Moreover, our department prepares students for entrance into universities and focuses on applying to CSU and UC engineering programs so they can obtain a bachelor's degree, and a bright future.

Part 2B: (Required for CTE) External Data: Advisory Committee Recommendations & Labor Market Data
Insert Advisory Committee Recommendations here (Please do not insert complete meeting minutes, but just recommendations from the advisory committee.)
Insert Labor Market Data here https://www.labormarketinfo.edd.ca.gov/commcolleges/

Part 2C: Review and comment on progress toward past Course Improvement Plans

List your past **Course Improvement Plans** (CIP) and progress toward meeting those plans.

Course	SLO Achievement Target	Actual SLO Performance	Change from previous SLO Performance
ENGR 110	70%	74.00%	-14.71
ENGR 125	70%	88.46%	-6.18
ENGR 130	70%	96.16%	-0.61
ENGR 140	70%	94.74%	+16.69
ENGR 185	70%	69.23%	-12.91
ENGR 210	70%	89.74%	+7.92
ENGR 230	70%	94.83% / 93.10%	+1.5 / +9.77

SLO:

a. **ENGR 110** - This course will continue to engage students through challenging projects and informative lectures preparing them for future coursework and transferring to university. This course does use materials for hands-on projects that are supported by the college. The continued funding would be needed to maintain the projects.

b. **ENGR 125** - This course continues to utilize MATLAB Online and zyBooks to maintain accessibility for students no matter their location. Relevant problems keep them engaged and show the applicability of the MATLAB software for their other coursework and real-world situations. This course does use specific software that is supported by the college. The continued funding would be needed to maintain the ability to teach the course.

c. **ENGR 130** - This course continues to bridge the gap between theoretical knowledge and practical knowledge for students. Our hands-on labs build students' abilities to solve complex engineering problems. This course does use materials for hands-on labs that are supported by the college. The continued funding would be needed to maintain the lab.

d. **ENGR 140** - This course continues to build students' knowledge of CAD through fun and engaging activities. Our project that spans the entire course culminates with all of the students' hard work being put together in one moveable assembly. This course does use specific software that is supported by the college. The continued funding would be needed to maintain the ability to teach the course.

e. **ENGR 185** - This course continues to build students' knowledge of electronic components, equipment, and software. Our hands-on labs get students engaged and deepen their understanding of the fundamentals of digital electronics. This course does use software, materials and equipment for hands-on labs that are supported by the college. The continued funding would be needed to maintain the lab.

f. **ENGR 210** - This class continues to build on students' prior knowledge of general physics. Students get to take their theoretical knowledge and apply it to a hands-on project to ensure deeper learning is achieved.

g. **ENGR 230** - This course continues to build on students' prior knowledge of general physics. Our hands-on labs get students engaged and deepen their knowledge of electronics and analog circuits. This course does use software, materials and equipment for hands-on labs that are supported by the college. The continued funding would be needed to maintain the lab.

Overall, all SLOs have met or exceeded achievement except ENGR 185. However, it is also worth noting that there was a -14.71% change in SLOs for ENGR 110 that also needs improvement.

Overall to improve SLO results, it is important to ensure that assessments are conducted accurately. Students that are not assessed need to be marked as N/A instead of a null score of 0. In order to enhance the success rate of SLOs of the ENGR 110 (Introduction to Engineering) course we will ensure that the course is taught more consistently among faculty and that collaboration between faculty occurs to ensure a robust course is being presented to our students. In order to enhance the success rate of SLOs of the ENGR 185 (Digital Logic) course we will undergo some more collaborative curriculum development both within the department and with other community colleges. There is opportunity to incorporate hands-on demonstrations within the lectures, ensure that the lab material is clear and ties to the lectures more directly, and have a fully developed lab manual.

Past Course Improvement Plans	Progress Made
N/A	N/A

Part 2D: Review and comment on progress towards past program review goals:
List your past program review goals and progress towards those goals.

Past Goal	Progress Made
Increase engineering degree completions	We had a 65% increase (20 to 33) from the prior year.
Increase the success of our courses that contain hands on lab section	Progress of this goal is ongoing. We now have dedicated lab space for lectures and specialized experiments, accompanied by lab-grade furniture. We hope that these new lab spaces will promote hands-on learning for our students and thus increase the success of our lab courses.
Improve student engagement within the engineering and science community	We have not been able to develop this goal due to time constraints on faculty and students.

Part 3: Based on Part 2 above, please list program/area goals for 2023-2024:								
Program /Area Goal #	Goal Supports which:				ESP Goal Primarily Supported:	Goal (Student-focused)	Steps to be taken to achieve the goal?	Measure of Success (How would you know you've achieved your goal?)
	ILO	PLO	SLO	OO				
#1	Choose ILO	Effectively employ techniques, skills, and computational tools necessary for engineering.			Goal 3: Focus on utilizing proven instructional strategies that will foster transferable intellectual skills	Increase engineering degree completions	We will continue to work with counseling and our students to make them aware of the degree pathways as well as continue increasing our articulation with universities to ensure all of our courses count. We will also be creating certificates to help capture students whose transfer university does not fit our degree pathways.	Compare our number of completions to previous years.

#	ILO				Goal			
#2	ILO 4. Career and Specialized Knowledge				Goal 5: Align instructional programs to the skills identified by the labor market	Enhance the writing and communication skills of engineering students	The Engineering Technical Writing Workshop will be designed to enhance the technical writing skills of engineering students. Effective communication is vital in the engineering field, and this workshop aims to provide students with the knowledge and practice they need to convey complex technical information clearly and concisely. The workshop will cover various aspects of technical writing, including reports, research papers, documentation, and presentations to be incorporated into all engineering courses with lab reports.	The quality of students' written assignments, reports and technical papers submitted.
#3	ILO 4. Career and Specialized Knowledge				Goal 5: Align instructional programs to the skills identified by the labor market	To elevate the proficiency of students in advanced Engineering 3D design	Utilize Advanced Manufacturing courses by cross listing them with ENGR to develop an advanced SolidWorks certification (CSWA/CSWP) program. Improving student enrollment capacities in both AM and ENGR disciplines.	The number of students passing certified Solidworks professional exams. The enrollment numbers of each program.
#4	ILO 3. Community/Global Consciousness				Goal 3: Focus on utilizing proven instructional strategies that will foster transferable intellectual skills	Increase outreach and enrollment in ENGR courses	Develop noncredit courses to increase enrollment in technical, engineering project based courses.	Comparison of enrollment numbers from past years.

Part 4: Resource Requests that Support Program Goals (Based on the above analysis, please use the following space to document resource requests)

Type of Resource Request	Summary of Request	Which of your Program/area goals (Part 3) does this request support?	New or Repeat Request	Amount of Request, ($)	One-Time or Recurring Cost, ($)	Contact's Name
Technology	The YH 116 lab requires a large projector, along with additional whiteboards on both sides of the classroom to enhance the quality of lectures and improve learning outcomes.	1,3,4	New	$10,000	One-time	Jonathan Compton
Supplies	Easy to use equipment for Material Science Lab. This includes tensile testers, hardness testers, Jominy tests, and specimens to go with these pieces of equipment	1,4	New	$200,000	One-time	Jonathan Compton
Choose an item.			Choose an item.		Choose an item.	
Choose an item.			Choose an item.		Choose an item.	
Choose an item.			Choose an item.		Choose an item.	

***REQUIRED: After gathering the information above, fill out your RESOURCE REQUESTS to be shared with the Budget Committee:**

https://www.surveymonkey.com/r/2023PR_ResourceRequest

Part 5: Insert your Program Review Data here and any other supporting data. (See Part 2A above).

Required:

- Program Review tab
- S&R by Demographic Groups tab

Optional:

- Other supporting data/information

Please Select **Subject** area (twice) and **Program Major(s)** to get your data -->
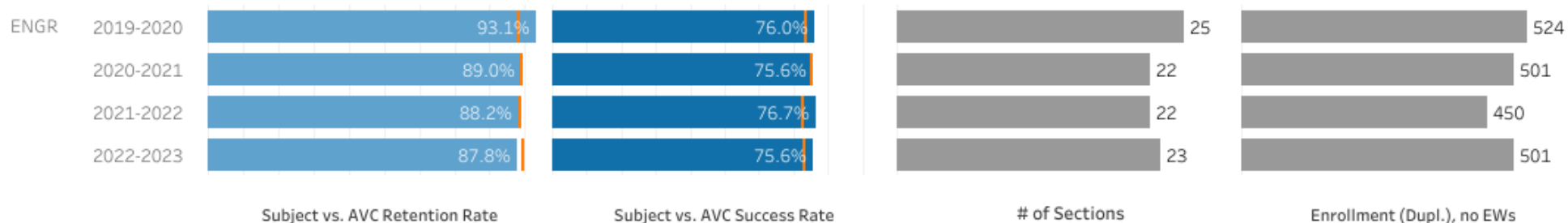
Select Subject	Select Subject again	Select Program Major(s)	Academic Year
ENGR	ENGR	Multiple values	Multiple values

Retention, Success, Number of Sections, & Enrollment in ENGR (Total AVC rates are shown as | *hover over to see data*)

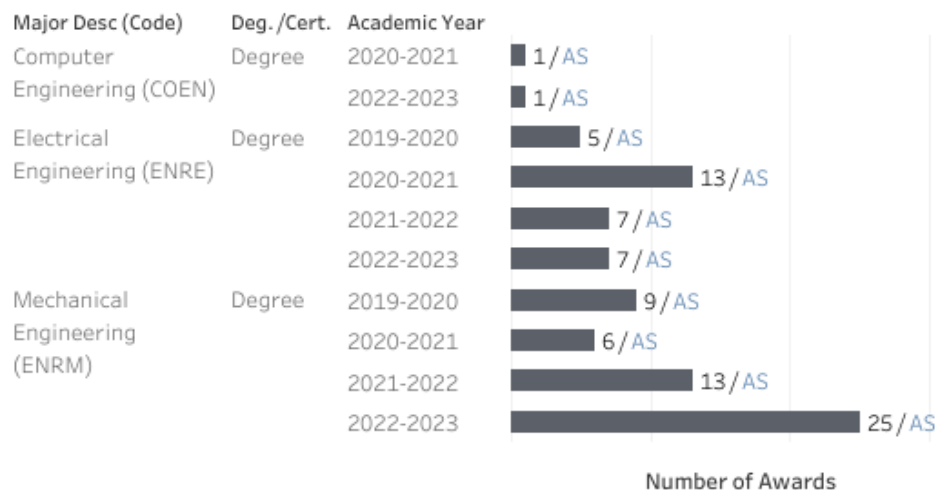| ENGR	Subject vs. AVC Retention Rate	Subject vs. AVC Success Rate	# of Sections	Enrollment (Dupl.), no EWs
2019-2020	93.1%	76.0%	25	524
2020-2021	89.0%	75.6%	22	501
2021-2022	88.2%	76.7%	22	450
2022-2023	87.8%	75.6%	23	501

Enrollment and Number of Sections by *Modality* in ENGR

	Instr. Method	2019-2020	2020-2021	2021-2022	2022-2023
Number of Sections	Online	5	7	10	11
	Other Indep Study	1	1	1	
	Traditional	19	14	11	12
Enrollment	Online	109	176	242	258
	Other Indep Study	1	1	1	
	Traditional	428	324	208	243

Enrollment and Number of Sections by *Location* in ENGR

	Location	2019-2020	2020-2021	2021-2022	2022-2023
Number of Sections	Lancaster	25	21	14	18
	Palmdale		1	8	5
Enrollment	Lancaster	538	475	256	374
	Palmdale		26	195	127

Number of Program Awards in Computer Engineering (COEN), Electrical Engineering (ENRE), Mechanical Engineering (ENRM)

Major Desc (Code)	Deg. /Cert.	Academic Year	Number of Awards
Computer Engineering (COEN)	Degree	2020-2021	1 / AS
		2022-2023	1 / AS
Electrical Engineering (ENRE)	Degree	2019-2020	5 / AS
		2020-2021	13 / AS
		2021-2022	7 / AS
		2022-2023	7 / AS
Mechanical Engineering (ENRM)	Degree	2019-2020	9 / AS
		2020-2021	6 / AS
		2021-2022	13 / AS
		2022-2023	25 / AS

FTEF by Contract Type, Part-time/Full-time Ratio, FTES, FTES/FTEF in ENGR

	Fall 2019	Fall 2020	Fall 2021	Fall 2022
PT (Adjunct) FTEF	1	1	1	1
FT (Regular) FTEF	1	1	1	2
FT (Overload) FTEF	1	1	1	0
TOTAL FTEF	3	3	3	3
PT/FT FTEF Ratio	1	1	1	0
FTES	33	32	27	28
FTES/FTEF Ratio	11	11	9	10
WSCH/FTEF Ratio	345	324	273	291
WSCH	1,000	972	800	

Click here
to see AVC's Program
awards dashboard

Last Update: 09/30/2022 .Data Sources: AVC's Banner, ARGOS reports

Subject-Level Retention Rate (RR), Success Rate (SR), and Enrollment by Sex & Race/Ethnicity as Compared to AVC's Rates (|)

If the Subject bars are below the vertical lines | , it indicates that equity gaps exist in SR or RR for those sub-groups as compared to overall SS or RR. Some questions to ask when looking at the data:
- What are the potential reasons for equity gaps? - What can my program implement to mitigate these gaps? (Consider such factors as curriculum design, teaching methods, campus climate, and support services.) - What resources/training are available/needed to support these efforts?

			Subject vs. AVC Retention Rate		Subject vs. AVC Success Rate		Enrollment
ENGR	B	2021-2022					
	Female	2019-2020	85.4%		64.6%		96
		2020-2021	86.8%		75.5%		106
		2021-2022	91.4%		75.9%		116
		2022-2023	89.4%		81.7%		104
	Male	2019-2020	95.2%		79.4%		417
		2020-2021	89.5%		75.8%		392
		2021-2022	87.0%		76.7%		331
		2022-2023	87.2%		73.7%		391
	Unknown/Oth..	2019-2020	81.8%		45.5%		11
		2020-2021					
		2021-2022					
		2022-2023					
ENGR	Hispanic/Latinx	2019-2020	92.5%		71.3%		320
		2020-2021	89.6%		72.8%		316
		2021-2022	86.7%		73.1%		286
		2022-2023	86.9%		74.1%		313
	African American/Black	2019-2020	87.5%		56.3%		16
		2020-2021	87.0%		73.9%		23
		2021-2022	83.3%		58.3%		12
		2022-2023	83.3%		45.8%		24
	White Non-Hispanic	2019-2020	94.4%		88.8%		125
		2020-2021	87.3%		81.4%		102
		2021-2022	94.4%		88.8%		89
		2022-2023	92.9%		86.9%		99
	Two or more races	2019-2020	88.9%		72.2%		18
		2020-2021	87.0%		78.3%		23
		2021-2022	85.7%		71.4%		21
		2022-2023	89.7%		86.2%		29
	Other	2019-2020	97.8%		82.2%		45
		2020-2021	91.9%		83.8%		37
		2021-2022	88.1%		83.3%		42
		2022-2023	83.3%		69.4%		36

Academic Year Slider

Click to Include EWs

2022-2023 Disproportionate Impact (DI) as Percentage Point Gap (PPG)
Blue Bars show Success Rate (SR) within the sub-Groups vs. **AVC Annual SR (orange bar)** vs. **ENGR** Annual SR (dotted line)

Subject	Student Demographics ..	Subject vs. AVC Success Rate	PPG	# of completers needed to close the gap
ENGR	African American/Black	45.8%	-26.8%	6
	Hispanic/Latinx	74.1%	1.5%	
	Two or more races	86.2%	13.6%	
	White Non-Hispanic	86.9%	14.3%	
	Other	69.4%	-3.2%	1

2022-2023 : 75.6% (ENGR Annual SR dotted line)

In 2022-2023, ENGR's Success Rate was **75.6%** vs. AVC's Annual rate of 72.6%
Overall Disproportionate Impact as percentage point gap was : 3.0%
In ENGR, 501 was the enrollment count (duplicated headcount) (only shows if $n > 10$)
If there is a Disproportionate impact (**PPG is negative)** , multiply the absolute value of PPG by the number of students and divide it by 100 to determine how many more successful completers would eliminate the gap.
(For example, (501 * |3.0%|)=15. it means that 15 more successful course completers would help close the gap for this subject area)
(Hover over each bar in the chart to see details about each sub-group)
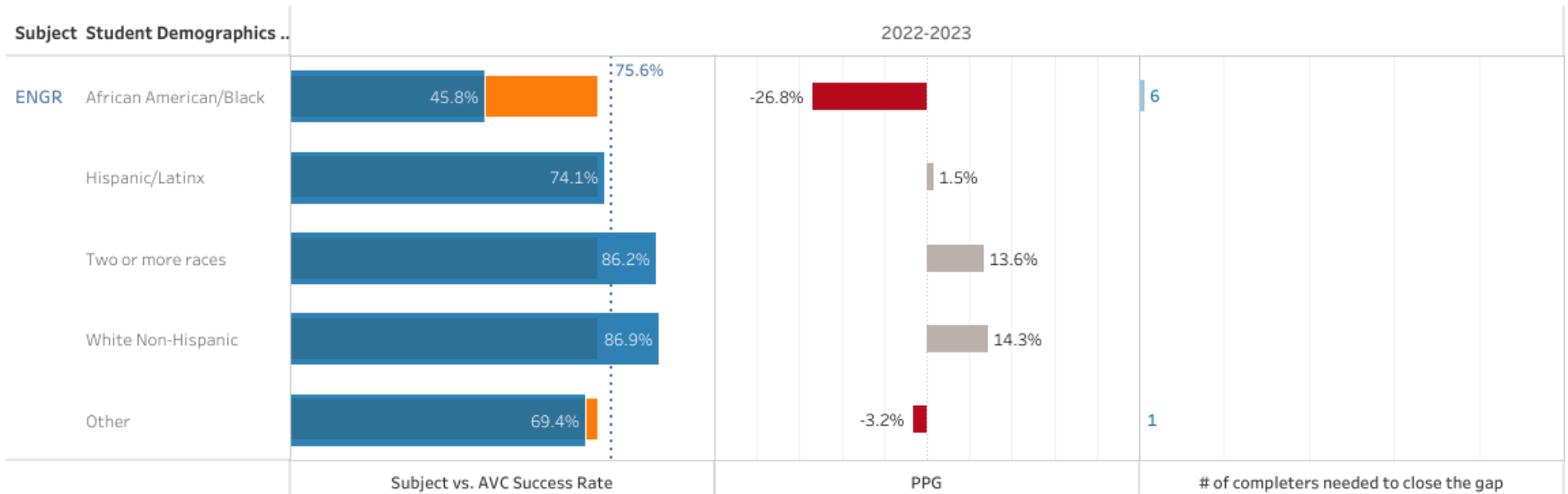
Some possible questions to ask when looking at the DI data:
- What are the potential reasons for equity gaps?
- What can my program implement to mitigate these gaps?
- What resources are available to support these efforts?

Academic Year Slider

Click to Include EWs

2022-2023 Disproportionate Impact (DI) as Percentage Point Gap (PPG)
Blue Bars show Success Rate (SR) within the sub-Groups vs. AVC Annual SR (orange bar) vs. ENGR Annual SR (dotted line)

Subject	Student Demographics ..	2022-2023		
		Subject vs. AVC Success Rate	PPG	# of completers needed to close the gap
ENGR	19 or Less	70.4% / 75.6%	-2.2%	4
	20-24	77.3%	4.7%	
	25-29	84.8%	12.2%	
	30-34	70.0%	-2.6%	1
	35-39			
	40-49			
	50+			

In 2022-2023, ENGR's Success Rate was 75.6% vs. AVC's Annual rate of 72.6%

Overall Disproportionate Impact as percentage point gap was : 3.0%

In ENGR, 501 was the enrollment count (duplicated headcount) (only shows if $n > 10$)

If there is a Disproportionate impact (*PPG is negative*) , multiply the absolute value of PPG by the number of students and divide it by 100 to determine how many more successful completers would eliminate the gap.

(For example, (501 * |3.0%|)=15. it means that 15 more successful course completers would help close the gap for this subject area)

(Hover over each bar in the chart to see details about each sub-group)

Some possible questions to ask when looking at the DI data:

- What are the potential reasons for equity gaps?
- What can my program implement to mitigate these gaps?
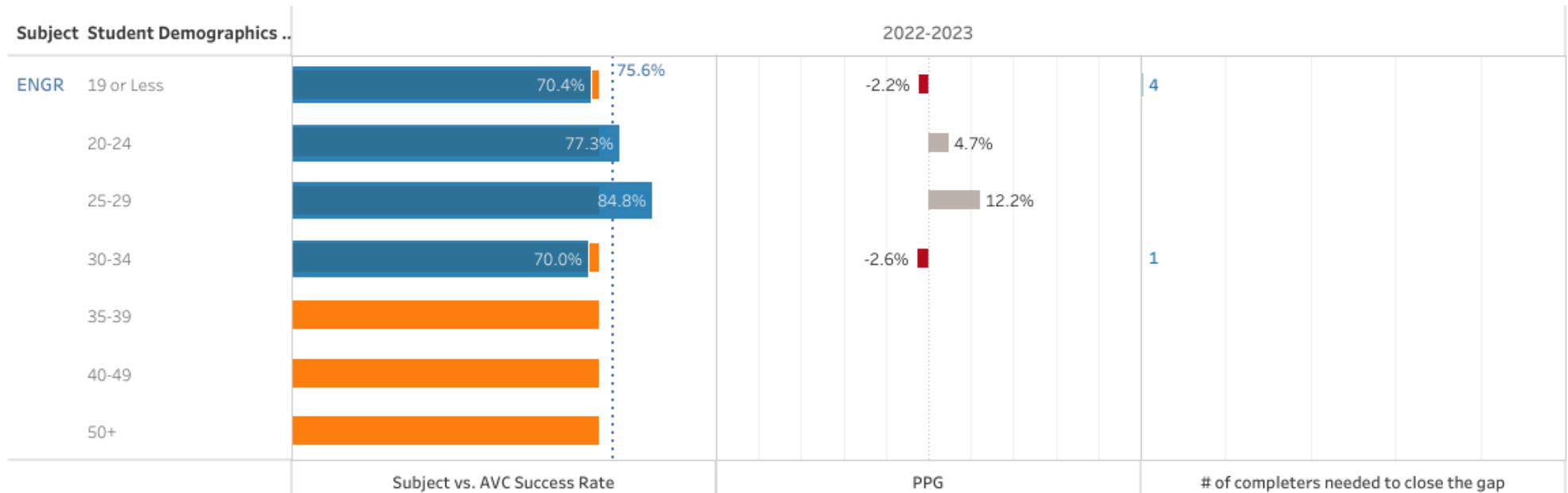- What resources are available to support these efforts?

Division/Area Name: Geosciences	For Planning Years: 2024-2025
Name of person leading this review: Dr. Mike Pesses	
Names of all participants in this review: Dr. Mike Pesses, Dr. Aurora Burd	

Part 1. Program Overview: *Briefly describe how the program contributes to the district mission*
The Geosciences Department contributes to the institution's "quality, comprehensive education" by offering rigorous courses that lead to associate degrees, transfer, and career technical education.

Part 2A: Analyze the program review data (retrieval instructions), including equity data and any internal/external environmental scan information (e.g., surveys, interviews, focus groups, advisory groups, licensure exam scores, & job placement) to identify the program Strengths, Opportunities & Aspirations:
Use the following questions to guide your analysis: Overall (Use the *Program Review* tab to inform your analysis) • What are the success and retention rates (S&R) for your discipline? Did they decrease or increase in the last year? • What are the trends for the number of awards granted? Are the number of awards going up or down? Equity (Use the *S & R by Demographic Group* or the *Equity* tab to inform your analysis) • Which racial/ethnic student groups complete their courses at the highest rates? • Which racial/ethnic student groups experience the largest gaps when compared to the highest-performing group? Analyze the trends across the last review period. If no equity gaps are present, please reflect on the strategies that are working in the *Strengths and Accomplishments* section.
Strengths and Accomplishments: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*
Consider the following questions: • What does your program/area do well, including capabilities and greatest accomplishments? • What are the practices that were implemented to increase success and retention rates or program awards? We have seen good growth in success and retention, which corresponds with a real push for removing economic barriers to course material. For many of our classes, students have either low cost or no cost materials. Despite all of the hurdles from the past few years, the Department of Geosciences has seen growth or stability in retention and success numbers, which may be connected to this effort. For GEOL in particular, we have increased our asynchronous online course offerings from no students in 2019-2020 to 334 in 2022-2023. Success rates have also increased through that time period, so the inference is that our asynchronous online course offerings should be considered successful.
Opportunities and Challenges: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*
Consider the following questions: • What does your program/area need to do better to support/improve student success? • What actions can be taken to help close equity gaps? The Department of Geosciences has repeatedly seen both full-time and adjunct faculty leave and never get replaced. Despite a large amount of course offerings and multiple programs, two full time faculty and at this point, one or two adjunct faculty, are spread across the schedule. If we are sincere in wanting to ensure success

as well as hoping to close equity gaps, faculty need to be able to focus on their students. This means we need an aggressive search for new adjunct faculty as well as the replacement of at least one full-time position. Not only do we struggle to offer the classes needed for students to complete degrees in a timely manner, but it can be truly difficult to create and grade meaningful assignments and give students productive feedback. Student enrollments have fluctuated, and while decreasing numbers have occurred across the college, much of our lower enrollment comes from not having the faculty to offer classes despite demand for them.

GEOL served 151 face-to-face students in 2021-2022 and only 24 face-to-face students in 2022-2023. The primary reason for the drop was cancellation of face-to-face sections while Dr. Burd was on maternity leave during Spring 2023. Despite giving months of notice to the division and HR, AVC was unable to hire either adjunct faculty or temporary full-time faculty to cover the GEOL 101L and GEOL 102L courses. All sections of GEOL 101L and GEOL 102L were thus cancelled for Spring 2023. Needless to say, this hindered the ability of AS-T Geology students as well as non-major students to finish their degrees, graduate, and transfer. This is also expected to negatively affect the number of students who may decide to continue from GEOL 101 into GEOL 102 as AS-T Geology students. Dr. Burd has heard anecdotally from students who are reluctant to take additional geoscience courses due to the students' perception of instability/unreliability in geoscience course scheduling.

Additionally, moving past the departmental level, the sheer amount of non-classroom work (CIPs, Program Review, Curriculum Updates, tenure, and evaluation) that occurs in the Fall takes time away from engaging with students and student work. We quickly try to get through reports like this one, just so we can move onto the next thing that needs to be done and have little time to really enact changes in our classes and degree programs.

The Program Review data attached at the end of this document is misleading as all distance ed modality classes appear to have been listed as having a location of Palmdale Center. Palmdale Center no longer attempts to offer geoscience classes, because not only are they regularly canceled due to low enrollment, but some labs are also lacking in required supplies (e.g. maps, rock samples). It is demoralizing to faculty to repeatedly lose a class due to the "good deed" of trying to offer it in Palmdale, and disruptive to students, who can't get the classes they were told would be available at the Palmdale Center.

ERSC 101, as a combined lecture & lab course, has not traditionally been DE-approved. The reason for this is that lab courses in GEOL and ERSC appear to need to be face-to-face for the course to be UC/CSU transferable (and the C-IDs for these courses all specify use of "real," not "virtual" rocks) now that AVC is no longer in an emergency remote format due to COVID-19. However, to meet students in the modality they most prefer, ERSC 101 was given DE approval to allow the course to run in a Blended format (lectures online, labs face-to-face). ERSC 101 is also part of the required coursework for students intending a career in K-6 education - AVC is currently ramping up a K-12 teacher preparation program that will likely increase demand for ERSC 101. ERSC 101 was offered in Blended format for Spring 2023 (after cancellation of two fully enrolled face-to-face sections) due to the inability to find an instructor able to teach the course face-to-face, but students were likely appreciative of the chance to take the course in this format. 47 students were able to take ERSC 101 in the blended format during Spring 2023.

Aspirations: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*

Consider the following questions:
- What does your program/area want to be known for?
- What is a desired future?

Our program has the ability to be known for giving students applied skills as well as a robust introduction to the geosciences. Our goal is to increase faculty numbers, increase class offerings and enrollment numbers, and increase student completion of our degrees.

The geoscience programs aim to prepare students for transfer into geography and geology programs across the state via the AA-T Geography and AS-T Geology. Work needs to be done to ensure that students are getting the most out of the AA-T in Geography program. One important facet of both geography and geology

programs is a healthy field component to get students out into the world to study the phenomena being discussed in the classroom. For a variety of reasons, the field components and classes in the Geography, Geology, and Earth Science programs have been neglected and need to be brought back to give students a better educational experience.

The ERSC 101 course is a required course for students pursuing careers as K-6 educators (although the course is also taken by students with other career goals/majors). We hope students who succeed in this course will bring the richness of geoscience to their future classrooms, with an understanding of how to seek up-to-date data, analysis, and interpretation of current issues such as California's geologic hazards (e.g., earthquake forecasting and preparation) and global climate change (including California's drought status and use of water resources, etc.). We also hope students who succeed in this course will share the joy of science with the next generation, so that over time, we have fewer students at the college level who claim disinterest, fear, or skepticism of geosciences. This is a diversity and equity issue, as current research suggests that children begin to fall out of the STEM pipeline during their K-6 education, and that those who do fall out of the pipeline are disproportionately low socioeconomic status, female, and minorities.

Part 2B: (Required for CTE) External Data: Advisory Committee Recommendations & Labor Market Data

The industry continues to move forward with ArcGIS Pro over the older ArcGIS Desktop software package. There is also a desire for employees who can problem-solve, rather than just follow directions.

Insert Labor Market Data here https://www.labormarketinfo.edd.ca.gov/commcolleges/

Projections of Employment by Occupation, 2018 - 2028

Selections:

TOP Code(s):
190100 Physical Sciences, General
191400 Geology
193000 Earth Science
220600 Geography
220610 Geographic Information Systems

Geography: California
Includes: All California Counties

Annual Job Openings by Occupation

SOC Code	Occupation Title (Linked to "Occupation Profile")	2018 Employment	Annual Job Openings (1)
251051	Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary	1,500	1,380
192042	Geoscientists, Except Hydrologists and Geographers	5,000	6,020
192043	Hydrologists	1,000	1,200
119199	Managers, All Other	160,400	147,200
252031	Secondary School Teachers, Except Special and Vocational Education	124,000	95,370
	Total	291,900	251,170

(1) Total Job Openings are the sum of new jobs from growth plus net replacements. Annual job openings are total job openings divided by the number of years in the projection period.

(2) This occupation has been suppressed due to confidentiality.

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Save or View in Excel   Back to Occupation List   New Search

Projections of Employment by Occupation, 2018 - 2028

Selections:

TOP Code(s):

190100 Physical Sciences, General
191400 Geology
193000 Earth Science
220600 Geography
220610 Geographic Information Systems

Geography: Los Angeles County
Includes: Los Angeles County

Annual Job Openings by Occupation

SOC Code	Occupation Title (Linked to "Occupation Profile")	2018 Employment	Annual Job Openings (1)
251051	Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary	420	400
251064	Geography Teachers, Postsecondary	130	120
192042	Geoscientists, Except Hydrologists and Geographers	600	740
119199	Managers, All Other	37,390	33,220
252031	Secondary School Teachers, Except Special and Vocational Education	32,870	25,860
	Total	71,410	60,340

(1) Total Job Openings are the sum of new jobs from growth plus net replacements. Annual job openings are total job openings divided by the number of years in the projection period.

(2) This occupation has been suppressed due to confidentiality.

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Projections of Employment by Occupation, 2018 - 2028

Selections:

TOP Code(s):

190100 Physical Sciences, General
191400 Geology
193000 Earth Science
220600 Geography
220610 Geographic Information Systems

Geography: Kern County
Includes: Kern County

Annual Job Openings by Occupation

SOC Code	Occupation Title (Linked to "Occupation Profile")	2018 Employment	Annual Job Openings (1)
192042	Geoscientists, Except Hydrologists and Geographers	210	260
119199	Managers, All Other	1,030	910
252031	Secondary School Teachers, Except Special and Vocational Education	2,300	1,860
	Total	3,540	3,030

(1) Total Job Openings are the sum of new jobs from growth plus net replacements. Annual job openings are total job openings divided by the number of years in the projection period.

(2) This occupation has been suppressed due to confidentiality.

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Part 2C: Review and comment on progress toward past Course Improvement Plans

List your past **Course Improvement Plans** (CIP) and progress toward meeting those plans.

Past Course Improvement Plans	Progress Made
GEOG classes: OER adoption and creation	Most of our classes now utilize free or low-cost materials. All materials are provided within Canvas and are as accessible as possible to ensure student access.
GEOG 205: Free access to GIS software	Working with ITS, we have managed to provide free software access to students registered in our GIS classes. As long as students have a PC, they can download and use software on their own computers. Those without can access the software in our STEM Center.

GEOL 101: It appears the students were overwhelmingly successful (85%) at meeting the achievement target (70%) for the single SLO for GEOL 101. The course was redesigned for the online synchronous environment throughout 2020-2021, and some of the changes were incorporated into the current post-COVID-shutdown online asynchronous versions of the course.

GEOL 101L: It appears the students were overwhelmingly successful (86%) at meeting the achievement target (70%) for the single SLO for GEOL 101L. The return to face-to-face lab instruction has been beneficial for the students - even if it is more difficult for students to complete the labs face-to-face versus online (because the online versions featured videos of instructor's hands doing the labs, and students didn't have as much opportunity to use their own curiosity and critical thinking to make it through the labs in an inquiry-based fashion), we believe they are learning more and retaining more. It is also easier to keep track of struggling students in the face-to-face environment and try to help them get back on track toward successful course completion. Given concerns about transferability of online labs, it is important that GEOL 101L be kept face-to-face if possible. Continued investment in lab materials is important since some materials have become used/degraded over time and we will not be able to offer these activities to students during GEOL 101L unless we continue to procure the lab materials.

GEOL 102: It appears the students were overwhelmingly successful (83%) at meeting the achievement target (70%) for the single SLO for GEOL 102. This course was taught during Spring 2023 when the instructor contributing to this report was on leave, so it's not clear how success can be sustained and supported. However, it should be noted that this course was taught in an online asynchronous format by an instructor who had not previously taught this course at AVC and is not expected to do so in the future.

GEOL 102L was cancelled due to lack of an instructor during 2022-2023 so no SLO data was collected, analyzed, or interpreted. It is almost certain that the course materials need a refresh since the course has not been taught face-to-face since Spring 2019 and in any capacity whatsoever since Spring 2021. GEOL 102/102L are the capstone course for geology majors and given concerns about transferability of online labs, it is important that GEOL 102L return to face-to-face format if possible. It's also critical to get GEOL 102L on the schedule ASAP since students seeking the AS-T Geology must take this course to receive their degree. When AVC goes too long without offering GEOL 102L, AVC will either lose student enrollment to other CCC or students will transfer to four-year universities without the AS-T Geology. Both outcomes are harmful to AVC's optimization of the CCC Student Centered Funding Formula (SCFF).

ERSC 101: Please note that the authors of this report did not teach ERSC 101 during Spring 2023, and one of the two faculty members who did teach the course during Spring 2023 has died. It appears the students were overwhelmingly successful (93%) at meeting the achievement target (70%) for the single SLO for ERSC 101. The course was redesigned for the online synchronous environment throughout 2020-2021, and some of the changes were incorporated into the current post-COVID-shutdown face-to-face version of the course for Fall 2022 and the new "BLENDED" version of the course for Spring 2023 (online asynchronous lecture taught by one instructor, with face-to-face lab taught by a different instructor, who has since died). Many state/federal websites that are clearinghouses of Earth Science data received beneficial updates during the pandemic, which made their data easier to access for instructors and students alike. Continued investment in lab materials is important, since some materials have become used/degraded over time (e.g., the glue used for the glacier simulation lab dried up during the shutdowns) and we will not be able to offer these activities to students during lab unless we continue to procure the lab materials. The inability to keep a somewhat constant pool of instructors to teach this course means that different instructors are trying to design different lab activities each semester and have little ability to build the course over time or refine lab activities based on the materials available or the abilities, preparation, or interests of the students. It's worth noting that this year's actual performance is excellent compared to the achievement target, but it is slightly lower than last year's 95%. It's possible the slight decline might be due to issues associated with having a new instructor for the face-to-face lab portion of the class and having the class co-taught by separate lecture and lab instructors.

Part 2D: Review and comment on progress towards past program review goals:

List your past program review goals and progress towards those goals.

Past Goal	Progress Made
1. Counseling Outreach	Some outreach has occurred, but a new shift towards marketing the GIS program as a short but effective way to get job skills is our new focus (see below).
2. Lab Technician	We have yet to obtain a dedicated Lab Tech for the geosciences.

Last year's program review included a goal of further development of our online offerings.

A new asynchronous GEOG 101 online course has been developed to comply with state standards for online coursework and to supplement our face-to-face offerings. Enrollment in online GEOG courses increased from 104 (2021-2022) to 253 (2022-2023). This is likely due to the successful launch of GEOG 101 in the online modality.

For GEOL 101, we have increased our asynchronous online course offerings from 236 students in 2021-2022 to 334 in 2022-2023. GEOL 101 also successfully completed the POCR review process during Summer 2023.

GEOL 102 ran successfully during Spring 2023 as an online course. It is planned to switch to a zero-cost open access textbook for Spring 2024.

ERSC 101 ran successfully during Spring 2023 in a Blended format (lectures online, labs face-to-face) for the first time.

Most labs need to remain face-to-face to be UC/CSU transferable, so there are no plans currently to convert ERSC 101 to a fully asynchronous online format. Likewise, there are also no plans to convert GEOL 101L and GEOL 102L to online formats given their C-IDs' emphasis on "real, not virtual" rocks.

We have done some outreach work, but not as much as we would have liked. Faculty attended a variety of virtual AVC tours, college information Zoom meetings for potential students, and face-to-face "major fair" events. We still need to complete some of the outreach material to be able to share with high school students and first year AVC students who might want to change their majors.

As mentioned in previous program reviews, fall 2018 saw an expansion of geoscience courses into the new Palmdale Center. While most lab materials have been duplicated at the Palmdale location, some labs are still missing supplies, including required materials like maps and rock samples. These materials need to be obtained so that Palmdale students can have an experience equivalent to Lancaster students. Due to the pandemic and class cancellations at the Palmdale Center, there has been no progress on this issue. We hope to acquire additional supplies this year along with a major refresh of supplies on the main campus for the GEOL 101L, GEOL 102L, and ERSC 101 classes.

Part 3: Based on Part 2 above, please list program/area goals for 2023-2024:								
Program /Area Goal #	Goal Supports which:				ESP Goal Primarily Supported:	Goal (Student-focused)	Steps to be taken to achieve the goal?	Measure of Success (How would you know you've achieved your goal?)
	ILO	PLO	SLO	OO				
#1	ILO 4. Career and Specialized Knowledge				Goal 3: Focus on utilizing proven instructional strategies that will foster transferable intellectual skills	Recruit students to the GIS Program	1. High School outreach 2. Develop and schedule classes to be 8-week, online classes so that the certificate can be completed within a year.	When enough students can fill a single section of GEOG 220.
#2	ILO 2. Creative, Critical, and Analytical Thinking				Goal 3: Focus on utilizing proven instructional strategies that will foster transferable intellectual skills	Acquire duplicate materials for Palmdale Center so that all ERSC, GEOG, and GEOL labs can be run at that location or the prison without needing to remove materials from the Lancaster Campus.	Work with lab tech to place a purchase order, then organize the supplies, arrange for IMC to laminate maps, transport them to the Palmdale Center, and store them in the available lab space.	When supplies are purchased, organized, and deployed to the Palmdale Center.
#3	ILO 2. Creative, Critical, and Analytical Thinking				Goal 3: Focus on utilizing proven instructional strategies that will foster	Refresh ERSC/GEOL supplies for main campus that have been worn out by student use or gone bad during the pandemic.	Work with lab tech to place a purchase order, then organize the supplies, arrange for IMC to laminate	When supplies are purchased, organized, and deployed to the Main Campus.

					transferable intellectual skills		maps, and store them in the available lab space.	
#4	ILO 2. Creative, Critical, and Analytical Thinking				Goal 3: Focus on utilizing proven instructional strategies that will foster transferable intellectual skills	Hire full-time and adjunct faculty to cover currently available courses.	Hire faculty.	No courses were canceled due to lack of instructor.

Part 4: Resource Requests that Support Program Goals (Based on the above analysis, please use the following space to document resource requests)

Type of Resource Request	Summary of Request	Which of your Program/area goals (Part 3) does this request support?	New or Repeat Request	Amount of Request, ($)	One-Time or Recurring Cost, ($)	Contact's Name
Faculty	Hire full-time and adjunct faculty to cover currently available courses.	#4	Repeat	$67304 – $92524	Recurring	Dr. Aurora Burd
Supplies	Acquire duplicate materials for Palmdale Center so that all ERSC, GEOG, and GEOL labs can be run at that location or the prison without needing to remove materials from the Lancaster Campus.	#2	Repeat	$3000	One-time	Dr. Aurora Burd
Supplies	Refresh ERSC/GEOL supplies for main campus that have been worn out by student use or gone bad during the pandemic.	#3	Repeat	$5000	One-time	Dr. Aurora Burd
Choose an item.			Choose an item.		Choose an item.	
Choose an item.			Choose an item.		Choose an item.	

***REQUIRED: After gathering the information above, fill out your RESOURCE REQUESTS to be shared with the Budget Committee:**
https://www.surveymonkey.com/r/2023PR_ResourceRequest

Part 5: Insert your Program Review Data here and any other supporting data. (See Part 2A above).
Required:
- Program Review tab
- S&R by Demographic Groups tab
Optional:
- Other supporting data/information

Please Select **Subject** area (twice) and **Program Major(s)** to get your data -->
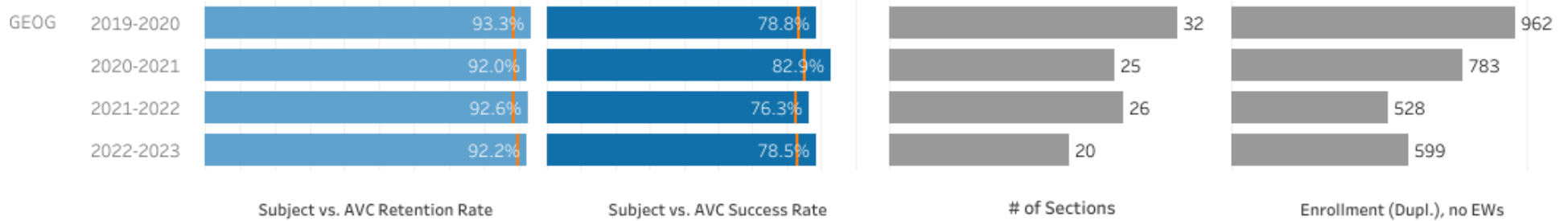
Select Subject	Select Subject again	Select Program Major(s)	Academic Year
GEOG	GEOG	Multiple values	Multiple values

Retention, Success, Number of Sections, & Enrollment in GEOG (Total AVC rates are shown as | *hover over to see data*)

		Subject vs. AVC Retention Rate	Subject vs. AVC Success Rate	# of Sections	Enrollment (Dupl.), no EWs
GEOG	2019-2020	93.3%	78.8%	32	962
	2020-2021	92.0%	82.9%	25	783
	2021-2022	92.6%	76.3%	26	528
	2022-2023	92.2%	78.5%	20	599

Enrollment and Number of Sections by *Modality* in GEOG

	Instr. Method	2019-2020	2020-2021	2021-2022	2022-2023
Number of Sections	Online	5	2	4	7
	Other Indep Study	1	2	2	
	Traditional	26	21	20	13
Enrollment	Online	146	59	104	253
	Other Indep Study	1	9	8	
	Traditional	825	715	416	346

Enrollment and Number of Sections by *Location* in GEOG

	Location	2019-2020	2020-2021	2021-2022	2022-2023
Number of Sections	Lancaster	26	21	19	11
	Palmdale	6	4	7	9
Enrollment	Lancaster	814	664	364	329
	Palmdale	158	119	164	270

Number of Program Awards in AA-T Geography (GEOT) & Geographic Info Systems LCert (GISX)

Major Desc (Code)	Deg./Cert.	Academic Year	Number of Awards
AA-T Geography (GEOT)	Degree	2020-2021	4 / AA
		2022-2023	2 / AA
Geographic Info Systems LCert (GISX)	Certifica..	2021-2022	3 / LC

FTEF by Contract Type, Part-time/Full-time Ratio, FTES, FTES/FTEF in GEOG

	Fall 2019	Fall 2020	Fall 2021	Fall 2022
PT (Adjunct) FTEF	1	1	1	1
FT (Regular) FTEF	1	1	1	1
FT (Overload) FTEF	1	1		
TOTAL FTEF	2	2	2	2
PT/FT FTEF Ratio	1	1	1	1
FTES	35	31	24	27
FTES/FTEF Ratio	17	16	14	17
WSCH/FTEF Ratio	497	494	412	514
WSCH	1,044	938	728	

Click here to see AVC's Program awards dashboard

Last Update: 09/30/2022 .Data Sources: AVC's Banner, ARGOS reports

Subject-Level Retention Rate (RR), Success Rate (SR), and Enrollment by Sex & Race/Ethnicity as Compared to AVC's Rates (|)

If the Subject bars are below the vertical lines | , it indicates that equity gaps exist in SR or RR for those sub-groups as compared to overall SS or RR. Some questions to ask when looking at the data:
- What are the potential reasons for equity gaps? - What can my program implement to mitigate these gaps? (Consider such factors as curriculum design, teaching methods, campus climate, and support services.) - What resources/training are available/needed to support these efforts?

GEOG		Year	Subject vs. AVC Retention Rate		Subject vs. AVC Success Rate		Enrollment
GEOG	B	2020-2021					
		2022-2023					
	Female	2019-2020	93.3%		79.4%		525
		2020-2021	92.9%		84.7%		450
		2021-2022	95.1%		80.9%		267
		2022-2023	90.7%		80.1%		301
	Male	2019-2020	93.3%		78.0%		432
		2020-2021	90.5%		80.4%		317
		2021-2022	90.1%		71.0%		252
		2022-2023	93.4%		76.6%		286
	Unknown/Oth..	2019-2020					
		2020-2021	93.3%		80.0%		15
		2021-2022					
		2022-2023					
GEOG	Hispanic/Latinx	2019-2020	92.2%		80.3%		599
		2020-2021	92.4%		84.0%		499
		2021-2022	92.7%		77.6%		303
		2022-2023	92.5%		76.7%		373
	African American/Black	2019-2020	94.7%		66.9%		133
		2020-2021	94.0%		76.2%		84
		2021-2022	97.2%		66.2%		71
		2022-2023	90.8%		70.8%		65
	White Non-Hispanic	2019-2020	97.0%		85.0%		133
		2020-2021	92.2%		88.7%		115
		2021-2022	91.3%		78.8%		104
		2022-2023	91.5%		82.9%		117
	Two or more races	2019-2020	88.0%		72.0%		50
		2020-2021	87.5%		80.0%		40
		2021-2022	93.3%		76.7%		30
		2022-2023	90.9%		90.9%		22
	Other	2019-2020	100.0%		83.0%		47
		2020-2021	86.7%		71.1%		45
		2021-2022	80.0%		80.0%		20
		2022-2023	95.5%		95.5%		22

Select Subject	Select Subject again	Select Program Major(s)	Academic Year
GEOL	GEOL	AS-T Geology (GET)	Multiple values

Retention, Success, Number of Sections, & Enrollment in GEOL (Total AVC rates are shown as │ *hover over to see data*)
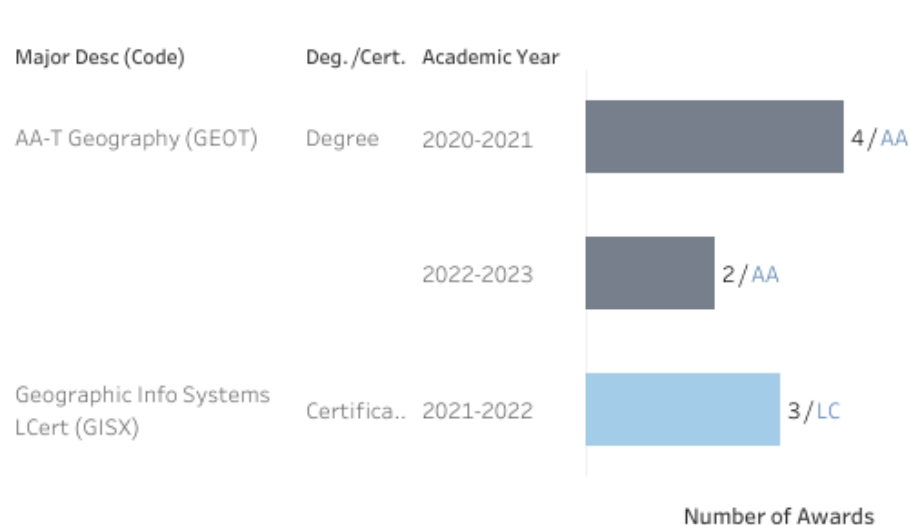
GEOL	Subject vs. AVC Retention Rate	Subject vs. AVC Success Rate	# of Sections	Enrollment (Dupl.), no EWs
2019-2020	87.1%	69.2%	11	295
2020-2021	88.6%	76.0%	9	246
2021-2022	94.5%	85.2%	11	385
2022-2023	92.7%	79.6%	8	358

Enrollment and Number of Sections by *Modality* in GEOL

	Instr. Method	2019-2020	2020-2021	2021-2022	2022-2023
Number of Sections	Online		3	5	7
	Traditional	11	6	6	1
Enrollment	Online		80	236	334
	Traditional	301	166	151	24

Enrollment and Number of Sections by *Location* in GEOL

	Location	2019-2020	2020-2021	2021-2022	2022-2023
Number of Sections	Lancaster	9	4	6	1
	Palmdale	2	5	5	7
Enrollment	Lancaster	245	104	151	24
	Palmdale	56	142	236	334

Number of Program Awards in AS-T Geology (GET)

Major Desc (Code)	Deg./Cert.	Academic Year	Number of Awards	
AS-T Geology (GET)	Degree	2019-2020		1/AS
		2021-2022		1/AS
		2022-2023		1/AS

FTEF by Contract Type, Part-time/Full-time Ratio, FTES, FTES/FTEF in GEOL

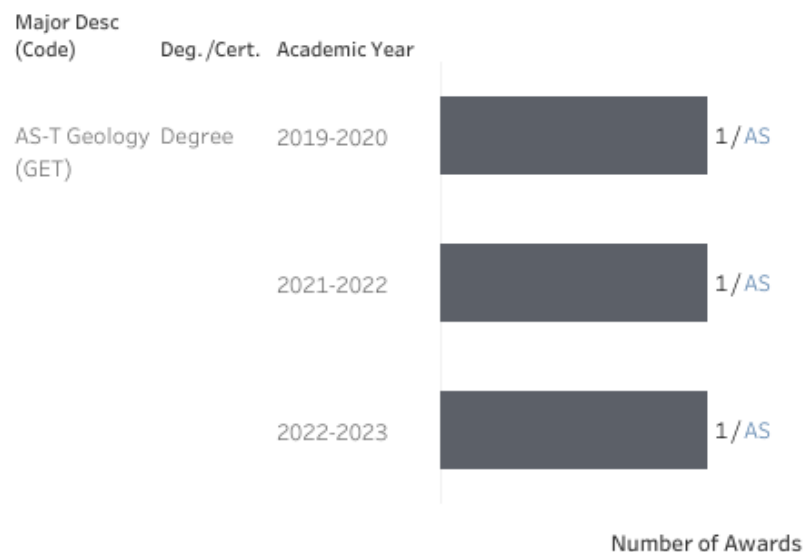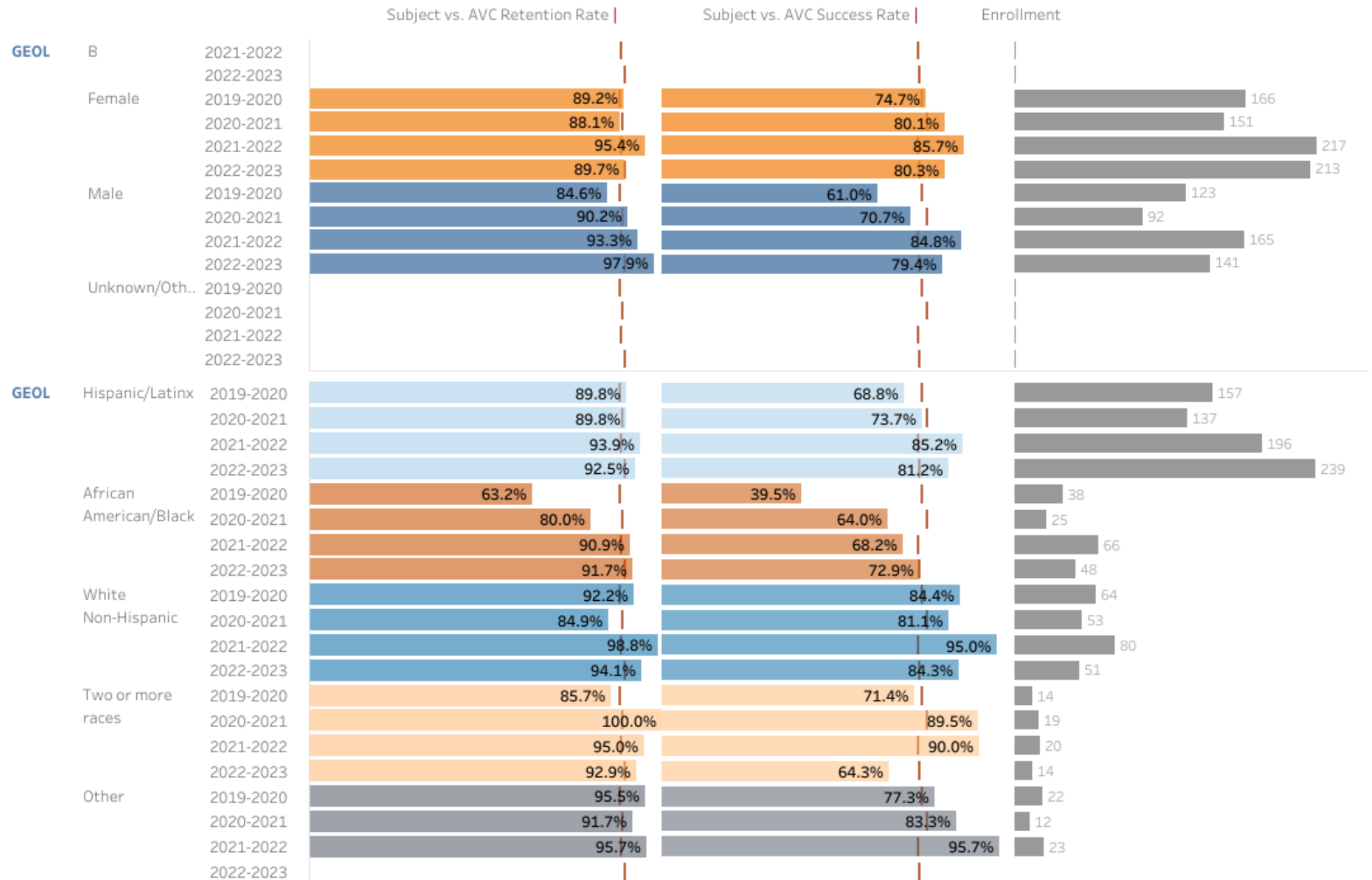|	Fall 2019	Fall 2020	Fall 2021	Fall 2022
FT (Regular) FTEF	0.9	0.6	0.7	0.2
FT (Overload) FTEF	0.4	0.3		0.4
TOTAL FTEF	1.3	0.9	0.7	0.6
PT/FT FTEF Ratio	0.0	0.0	0.0	
FTES	16.4	15.7	14.5	11.9
FTES/FTEF Ratio	12.6	17.4	19.8	20.9
WSCH/FTEF Ratio	378.9	521.7	595.3	626.3
WSCH	491.1	469.5	435.0	

Click here to see AVC's Program awards dashboard

Subject-Level Retention Rate (RR), Success Rate (SR), and Enrollment by Sex & Race/Ethnicity as Compared to AVC's Rates (|)

If the Subject bars are below the vertical lines | , it indicates that equity gaps exist in SR or RR for those sub-groups as compared to overall SS or RR. Some questions to ask when looking at the data:
- What are the potential reasons for equity gaps? - What can my program implement to mitigate these gaps? (Consider such factors as curriculum design, teaching methods, camp climate, and support services.) - What resources/training are available/needed to support these efforts?

GEOL	Sub-group	Year	Subject vs. AVC Retention Rate	Subject vs. AVC Success Rate	Enrollment
GEOL	B	2021-2022			
		2022-2023			
	Female	2019-2020	89.2%	74.7%	166
		2020-2021	88.1%	80.1%	151
		2021-2022	95.4%	85.7%	217
		2022-2023	89.7%	80.3%	213
	Male	2019-2020	84.6%	61.0%	123
		2020-2021	90.2%	70.7%	92
		2021-2022	93.3%	84.8%	165
		2022-2023	97.9%	79.4%	141
	Unknown/Oth..	2019-2020			
		2020-2021			
		2021-2022			
		2022-2023			
GEOL	Hispanic/Latinx	2019-2020	89.8%	68.8%	157
		2020-2021	89.8%	73.7%	137
		2021-2022	93.9%	85.2%	196
		2022-2023	92.5%	81.2%	239
	African American/Black	2019-2020	63.2%	39.5%	38
		2020-2021	80.0%	64.0%	25
		2021-2022	90.9%	68.2%	66
		2022-2023	91.7%	72.9%	48
	White Non-Hispanic	2019-2020	92.2%	84.4%	64
		2020-2021	84.9%	81.1%	53
		2021-2022	98.8%	95.0%	80
		2022-2023	94.1%	84.3%	51
	Two or more races	2019-2020	85.7%	71.4%	14
		2020-2021	100.0%	89.5%	19
		2021-2022	95.0%	90.0%	20
		2022-2023	92.9%	64.3%	14
	Other	2019-2020	95.5%	77.3%	22
		2020-2021	91.7%	83.3%	12
		2021-2022	95.7%	95.7%	23
		2022-2023			

Please Select **Subject** area (twice) and **Program Major(s)** to get your data -->

Retention, Success, Number of Sections, & Enrollment in ERSC (Total AVC rates are shown as │ *hover over to see data*)

		Subject vs. AVC Retention Rate	Subject vs. AVC Success Rate	# of Sections	Enrollment (Dupl.), no EWs
ERSC	2019-2020	95.1%	88.1%	6	143
	2020-2021	98.1%	95.3%	4	107
	2021-2022	95.1%	88.2%	4	102
	2022-2023	98.9%	92.5%	4	93

Enrollment and Number of Sections by *Modality* in ERSC

	Instr. Method	2019-2020	2020-2021	2021-2022	2022-2023
Number of Sections	Online				2
	Traditional	6	4	4	2
Enrollment	Online				47
	Traditional	145	107	102	46

Enrollment and Number of Sections by *Location* in ERSC

	Location	2019-2020	2020-2021	2021-2022	2022-2023
Number of Sections	Lancaster	5	4	4	4
	Lancaster [O..	1			
Enrollment	Lancaster	123	107	102	93
	Lancaster [O..	22			

Number of Program Awards in None

FTEF by Contract Type, Part-time/Full-time Ratio, FTES, FTES/FTEF in **ERSC**

	Fall 2019	Fall 2020	Fall 2021	Fall 2022
PT (Adjunct) FTEF			0.4	
FT (Regular) FTEF	0.2	0.6	0.4	0.8
FT (Overload) FTEF	0.6	0.2		
TOTAL FTEF	0.8	0.8	0.8	0.8
PT/FT FTEF Ratio	0.0	0.0	1.0	
FTES	10.8	11.4	9.7	9.5
FTES/FTEF Ratio	13.5	14.2	12.2	11.9
WSCH/FTEF Ratio	404.3	427.1	365.3	356.3
WSCH	323.4	341.7	292.2	

Click here
to see AVC's Program
awards dashboard

Last Update: 09/30/2022 .Data Sources: AVC's Banner, ARGOS reports

Subject-Level Retention Rate (RR), Success Rate (SR), and Enrollment by Sex & Race/Ethnicity as Compared to AVC's Rates (|)

If the Subject bars are below the vertical lines | , it indicates that equity gaps exist in SR or RR for those sub-groups as compared to overall SS or RR. Some questions to ask when looking at the data:
- What are the potential reasons for equity gaps? - What can my program implement to mitigate these gaps? (Consider such factors as curriculum design, teaching methods, camp climate, and support services.) - What resources/training are available/needed to support these efforts?

			Subject vs. AVC Retention Rate |	Subject vs. AVC Success Rate |	Enrollment
ERSC	Female	2019-2020	94.1%	85.9%	85
		2020-2021	97.0%	95.5%	67
		2021-2022	94.3%	91.4%	70
		2022-2023	100.0%	94.0%	67
	Male	2019-2020	96.4%	92.7%	55
		2020-2021	100.0%	94.4%	36
		2021-2022	96.9%	81.3%	32
		2022-2023	96.0%	88.0%	25
	Unknown/Oth..	2019-2020			
		2020-2021			
		2022-2023			
ERSC	Hispanic/Latinx	2019-2020	94.7%	86.7%	75
		2020-2021	97.3%	93.2%	73
		2021-2022	95.5%	87.9%	66
		2022-2023	98.4%	93.5%	62
	African American/Black	2019-2020	100.0%	96.4%	28
		2020-2021	100.0%	100.0%	14
		2021-2022			
		2022-2023	100.0%	78.6%	14
	White Non-Hispanic	2019-2020	95.5%	90.9%	22
		2020-2021	100.0%	100.0%	16
		2021-2022	95.5%	90.9%	22
		2022-2023	100.0%	100.0%	11
	Two or more races	2019-2020			
		2020-2021			
		2021-2022			
		2022-2023			
	Other	2019-2020	90.9%	81.8%	11
		2020-2021			
		2021-2022			
		2022-2023			

e

Below is a comment from Fall 2023 student evaluation of geoscience class mentioning the need for a refresh of the lab supplies on the main campus.

"This course could be improved with better quality samples. It is often difficult to determine certain properties of the minerals and rocks we are provided because they contain other materials we are not looking for. The glass plates for scratching that we were provided were very scratched, which makes it difficult to determine the hardness of the samples we are examining because we cannot tell which lines we may have made or not."

Division/Area Name: SME/Mathematics	**For Planning Years: 2024-2025**
Name of person leading this review: James Dorn	
Names of all participants in this review: Josh Strong, Hal Huntsman	

Part 1. Program Overview: *Briefly describe how the program contributes to the district mission*
The mathematics department provides a quality, comprehensive education to a diverse population of learners. Most awards at AVC have a math requirement so though we may not have an extensive number of degree pursuers, the impact of the department is widespread.

Part 2A: Analyze the program review data (retrieval instructions), including equity data and any internal/external environmental scan information (e.g., surveys, interviews, focus groups, advisory groups, licensure exam scores, & job placement) to identify the program Strengths, Opportunities & Aspirations:
Use the following questions to guide your analysis: Overall (Use the *Program Review* tab to inform your analysis) • What are the success and retention rates (S&R) for your discipline? Did they decrease or increase in the last year? • What are the trends for the number of awards granted? Are the number of awards going up or down? Equity (Use the *S & R by Demographic Group* or the *Equity* tab to inform your analysis) • Which racial/ethnic student groups complete their courses at the highest rates? • Which racial/ethnic student groups experience the largest gaps when compared to the highest-performing group? Analyze the trends across the last review period. If no equity gaps are present, please reflect on the strategies that are working in the *Strengths and Accomplishments* section.
Strengths and Accomplishments: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*
The number of AS-T degrees in math held steady compared to the last academic year. If fact, there was an increase of 1. This is an improvement on the trend over the past 3 years, where the number was steadily decreasing. Success and retention rates have been relatively stable over the last four academic years. The demographics with the highest success and retention rates are both in the gender and race categories. This poses an interesting question as to what type of student prefers not to identify in such categories. The Math Department continues to be united in providing quality instruction while holding a high standard of rigor across all courses. We continue to adapt to the changing environment with an effort to increase our online offerings. Additionally, legislation continues to shape the matriculation of students with the reinterpretation of AB705 and the implementation of the now AB1705. We have responded to the initial mandates by incorporating corequisite support classes for our entry level STEM and non-STEM courses, but continued changes in placement policies and the reduction of prerequisites in STEM classes casts serious doubts on the philosophy and direction required to see any gains in student success.
Opportunities and Challenges: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*
Success and retention rates in math continue to lag behind the rates for AVC by approximately 10 percentage points, though success rates year over year are down only three basis points. In the gender category, we experienced a slight decrease in success and retention rates among females while respective rates for males held steady. In the race category, success and retention rates for both Hispanic and Black continued to trend lower while there was a slight increase in both for Whites, two or more races, and other.

Provided that the data is correct, we experienced significant increases in PLO performance, 8.5 and 10 percentage points respectively (PLO#1 76.5% up from 68% and PLO#2 71% up from 61%. At the same time, SLO results were mixed. The biggest takeaway from these results is that our PLO and SLO results are not an accurate predictor of success and retention. Largely, this is to be expected as it is well recognized that there are many factors that determine a student's success and retention in a particular course outside of how a student performed on a specific SLO assessment. The Math department has begun conversations concerning student success across courses that we teach with a primary focus on STEM by forming a Math 150 workgroup. This workgroup, which has its first meeting in November, will hopefully be able to reach some level of standardization in Math 150 and promote that throughout the sequence.

The Math Department continues to experience challenges from the aftereffects of AB705, its reinterpretation, the shift to online in response to the pandemic and perceived student preference, and the implementation of AB1705. The mathematics department is at odds with attempting to close equity gaps while AB1705 continues to change the placement rules for students entering the math program and eliminating prerequisites for STEM courses based on meta-analyses from the RP Group/Chancellor's Office.

Aspirations: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*

It is hoped that the Math Department will be able to identify a viable strategy to meet the challenges that AB705 has and AB1705 will continue to create. Through our efforts to create a new pathway to Calculus, which is on pause due to AB1705, and the incorporation of co-requisite courses for our entry level transfer and STEM classes, we look forward to the time where students can accurately access their own learning needs and enroll in the course structure that provides the greatest opportunity to be successful. Perhaps the biggest hurdle to achieving this goal is that the support systems enacted are new to AVC and up to this point have been to this point voluntary. With a continued effort to identify the appropriate subgroups of students based on multiple measures placement data and making support for the identified populations compulsory, we hope to arrive at a point where are success rates for all populations in all demographic categories meet or exceed the average success rate of students at AVC. As has been the case, the state approved metrics for the upcoming potential changes in the STEM pathway have largely yet to be determined, which inhibits our ability to be proactive and mandate corequisite courses for those students who would benefit.

Part 2B: (Required for CTE) External Data: Advisory Committee Recommendations & Labor Market Data

Insert Advisory Committee Recommendations here (Please do not insert complete meeting minutes, but just recommendations from the advisory committee.)

Insert Labor Market Data here https://www.labormarketinfo.edd.ca.gov/commcolleges/

Part 2C: Review and comment on progress toward past Course Improvement Plans

List your past **Course Improvement Plans** (CIP) and progress toward meeting those plans.

Past Course Improvement Plans	**Progress Made**
Add more corequisite support	Support courses have been created for MATH 115, 135, 140, 150
Increase access to technology	Nearly all sections of MATH 115 are in computer labs for Fall 2024
*See Below	

Part 2D: Review and comment on progress towards past program review goals:

List your past program review goals and progress towards those goals.

Past Goal	**Progress Made**
To create mandatory corequisite support courses for MATH 115 and MATH 135 based on multiple measures placement rubrics.	We have made corequisite support classes mandatory for the lowest GPA band for Math135. We are in the process of determining whether we have the resources available for mandatory support for the lowest GPA band for Math115.

To increase the opportunities for professional development for our faculty so they can better promote the success of our students.	Progress on this goal has stalled due to changes in the VPAA role. It is hoped that the Chancellor's Office initiative providing resources in this area will be revisited soon. If not, we will explore alternative methods of funding.

Part 3: Based on Part 2 above, please list program/area goals for 2023-2024:							
Program /Area Goal #	Goal Supports which:				ESP Goal Primarily Supported:	Goal (Student-focused)	Steps to be taken to achieve the goal?	Measure of Success (How would you know you've achieved your goal?)
	ILO	PLO	SLO	OO				
#1	ILO 2. Creative, Critical, and Analytical Thinking	PLO#1 PLO#2			Goal 3: Focus on utilizing proven instructional strategies that will foster transferable intellectual skills	Provide students with the necessary extra assistance during class time.	1. Create more corequisite support courses. 2. Incorporate more embedded and SI tutors.	Success rates increase across all demographic groups.
#2	ILO 2. Creative, Critical, and Analytical Thinking	PLO#1 PLO#2			Goal 4: Advance more students to college-level coursework- Develop and implement effective placement tools	Increase the opportunities for professional development specifically targeted at disproportionately affected subgroups.	1. Identify and bring appropriate professional development facilitators to campus 2. Incentivize faculty to attend sessions and change their practice to improve student success	1. Increase in math professional development activities. 2. Progress in closing equity gaps.

Part 4: Resource Requests that Support Program Goals (Based on the above analysis, please use the following space to document resource requests)

Type of Resource Request	Summary of Request	Which of your Program/area goals (Part 3) does this request support?	New or Repeat Request	Amount of Request, ($)	One-Time or Recurring Cost, ($)	Contact's Name
Choose an item.			Choose an item.		Choose an item.	
Choose an item.			Choose an item.		Choose an item.	

***REQUIRED: After gathering the information above, fill out your RESOURCE REQUESTS to be shared with the Budget Committee:**
https://www.surveymonkey.com/r/2023PR_ResourceRequest

Part 5: Insert your Program Review Data here and any other supporting data. (See Part 2A above).
Required:
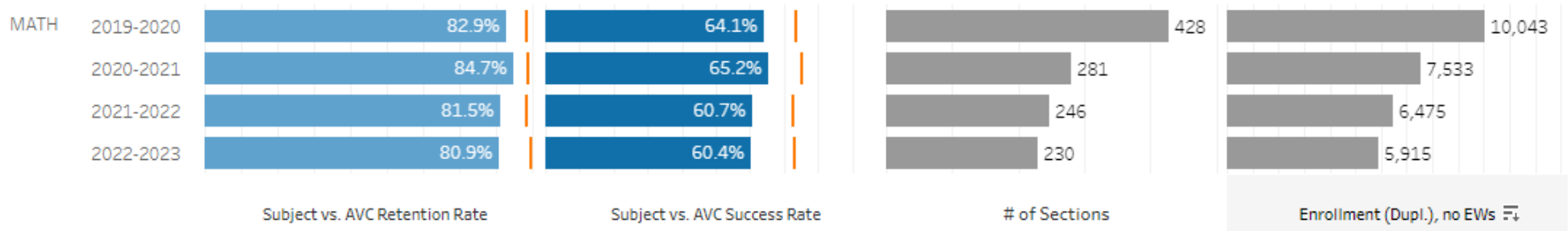- Program Review tab
- S&R by Demographic Groups tab

Optional:
- Other supporting data/information

Select Subject
MATH ▼

Select Subject again
MATH ▼

Select Program Major(s) ▼
(Multiple values) ▼

Academic Year
(Multiple values) ▼

Retention, Success, Number of Sections, & Enrollment in MATH (Total AVC rates are shown as | *hover over to see data*)
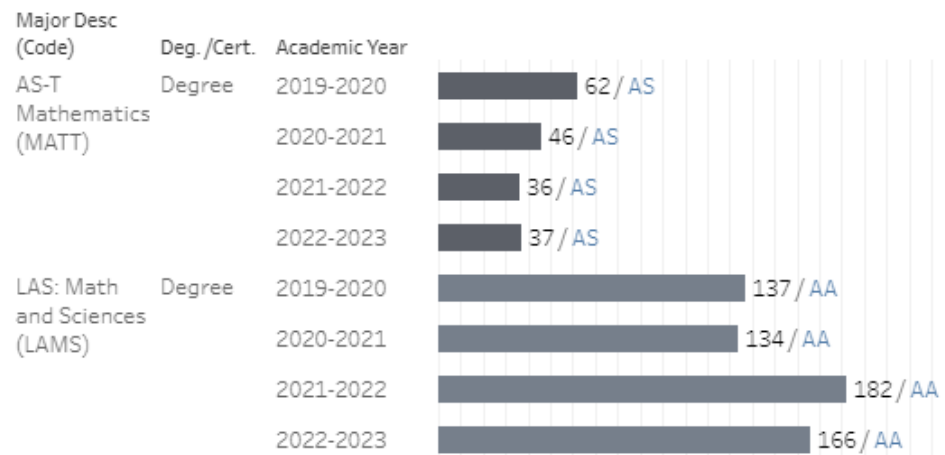
MATH	Subject vs. AVC Retention Rate	Subject vs. AVC Success Rate	# of Sections	Enrollment (Dupl.), no EWs
2019-2020	82.9%	64.1%	428	10,043
2020-2021	84.7%	65.2%	281	7,533
2021-2022	81.5%	60.7%	246	6,475
2022-2023	80.9%	60.4%	230	5,915

Enrollment and Number of Sections by *Modality* in MATH

	Instr. Method	2019-2020	2020-2021	2021-2022	2022-2023
Number of Sections	Online	3	2	21	25
	Other Indep Study			2	
	Traditional	425	279	223	205
Enrollment	Online	81	59	2,746	774
	Other Indep Study			3	
	Traditional	10,286	7,485	3,738	5,144

Enrollment and Number of Sections by *Location* in MATH

	Location	2019-2020	2020-2021	2021-2022	2022-2023
Number of Sections	Lancaster	361	246	205	187
	Lancaster [O..	12	9	9	10
	Palmdale	53	24	30	29
	Palmdale [Of..	2	2	2	4
Enrollment	Lancaster	8,593	6,472	3,343	4,754
	Lancaster [O..	288	244	210	226
	Palmdale	1,432	765	2,898	846
	Palmdale [Of..	54	63	36	92

Number of Program Awards in AS-T Mathematics (MATT) & LAS: Math and Sciences (LAMS)

Major Desc (Code)	Deg./Cert.	Academic Year	Awards
AS-T Mathematics (MATT)	Degree	2019-2020	62 / AS
		2020-2021	46 / AS
		2021-2022	36 / AS
		2022-2023	37 / AS
LAS: Math and Sciences (LAMS)	Degree	2019-2020	137 / AA
		2020-2021	134 / AA
		2021-2022	182 / AA
		2022-2023	166 / AA

FTEF by Contract Type, Part-time/Full-time Ratio, FTES, FTES/FTEF in MATH

	Fall 2019	Fall 2020	Fall 2021	Fall 2022
PT (Adjunct) FTEF	12	10	6	5
FT (Regular) FTEF	22	21	19	18
FT (Overload) FTEF	3	1	2	1
TOTAL FTEF	37	32	27	23
PT/FT FTEF Ratio	1	0	0	0
FTES	571	449	353	331
FTES/FTEF Ratio	16	14	13	14
WSCH/FTEF Ratio	468	421	392	425
WSCH	17,139	13,467	10,589	

Click here

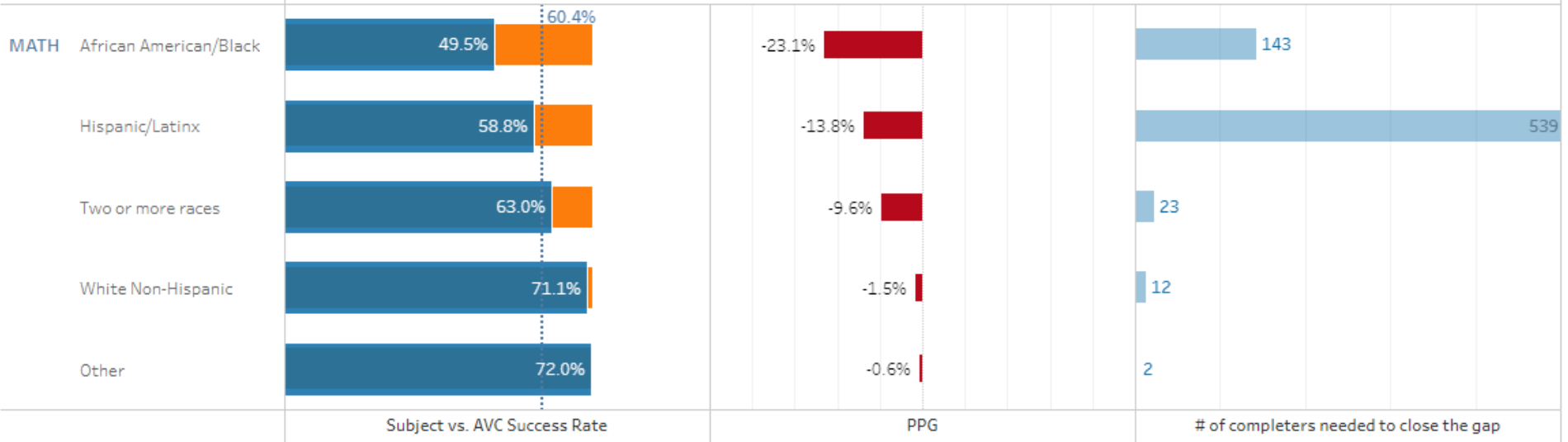|			Subject vs. AVC Retention Rate	Subject vs. AVC Success Rate	Enrollment
MATH	B	2020-2021			
		2021-2022	68.8%	50.0%	16
		2022-2023	83.3%	62.5%	24
	Female	2019-2020	83.9%	66.4%	5,581
		2020-2021	85.2%	66.4%	4,307
		2021-2022	82.2%	62.6%	3,608
		2022-2023	80.9%	61.7%	3,091
	Male	2019-2020	81.7%	61.4%	4,328
		2020-2021	84.1%	63.6%	3,136
		2021-2022	80.6%	58.0%	2,786
		2022-2023	80.7%	58.9%	2,700
	Unknown/Oth..	2019-2020	82.8%	61.2%	134
		2020-2021	85.5%	63.9%	83
		2021-2022	81.5%	66.2%	65
		2022-2023	87.0%	65.0%	100
MATH	Hispanic/Latinx	2019-2020	82.9%	63.4%	6,126
		2020-2021	84.5%	63.9%	4,642
		2021-2022	82.1%	60.6%	4,036
		2022-2023	80.6%	58.8%	3,896
	African American/Black	2019-2020	80.7%	56.3%	1,219
		2020-2021	80.4%	53.7%	810
		2021-2022	76.7%	49.0%	743
		2022-2023	72.8%	49.5%	618
	White Non-Hispanic	2019-2020	84.9%	71.8%	1,495
		2020-2021	87.4%	73.6%	1,202
		2021-2022	81.8%	66.8%	973
		2022-2023	86.1%	71.1%	820
	Two or more races	2019-2020	83.4%	66.0%	429
		2020-2021	84.2%	63.9%	355
		2021-2022	77.9%	59.1%	303
		2022-2023	83.4%	63.0%	235
	Other	2019-2020	82.6%	66.8%	774
		2020-2021	87.4%	75.6%	524
		2021-2022	85.0%	69.0%	420
		2022-2023	85.8%	72.0%	346

Subject Student Demographics

		Subject vs. AVC Success Rate	PPG	# of completers needed to close the gap
MATH	19 or Less	58.8% / 60.4%	-13.8%	380
	20-24	60.9%	-11.7%	232
	25-29	60.8%	-11.8%	58
	30-34	63.3%	-9.3%	26
	35-39	66.7%	-5.9%	11
	40-49	68.8%	-3.8%	6
	50+	61.8%	-10.8%	7

2022-2023

In 2022-2023, MATH's Success Rate was 60.4% vs. AVC's Annual rate of 72.6%

Subject	Student Demographics .	2022-2023		

MATH

Student Demographics	Subject vs. AVC Success Rate	PPG	# of completers needed to close the gap
African American/Black	49.5% / 60.4%	-23.1%	143
Hispanic/Latinx	58.8%	-13.8%	539
Two or more races	63.0%	-9.6%	23
White Non-Hispanic	71.1%	-1.5%	12
Other	72.0%	-0.6%	2

In 2022-2023, MATH's Success Rate was 60.4% vs. AVC's Annual rate of 72.6%

Annual ▼

Grade Distribution for MATH based on all enrolled students, including those who received "EW"s during Spring 2020

| | MW | IP | I | EW | W | RD | P | NP | F | D | C | B | A |

MATH	2019-2020	16% (W) · 13% (F) · 5% (D) · 17% (C) · 20% (B) · 23% (A)
	2020-2021	15% (W) · 14% (F) · 5% (D) · 15% (C) · 21% (B) · 28% (A)
	2021-2022	18% (W) · 15% (F) · 5% (D) · 15% (C) · 19% (B) · 26% (A)
	2022-2023	19% (W) · 14% (F) · 5% (D) · 13% (C) · 18% (B) · 27% (A)

MATH (only shows if n >10)

Minor variation in numbers might occur due to rounding

Subject	A, B, C & P	D & F	NP	W	I, IP, RD	EW	MW

MATH — With "EW"s

	A, B, C & P	D & F	NP	W	EW
2018-2019	66.5%	11.2%	8.1%	14.2%	
2019-2020	62.1%	17.9%	0.3%	16.5%	3.1%
2020-2021	65.1%	19.2%	0.2%	15.3%	0.1%
2021-2022	60.6%	20.5%		18.5%	0.2%

MATH — Without "EW"s

	A, B, C & P	D & F	NP	W
2018-2019	66.5%	11.2%	8.1%	14.2%
2019-2020	64.1%	18.5%	0.3%	17.0%
2020-2021	65.2%	19.2%	0.2%	15.3%
2021-2022	60.7%	20.6%		18.5%

Course	SLO	Achievement Target	Actual Performance
MATH 110 Mathematics for Liberal Arts Students	Analyze and solve level-appropriate problems including sets, and logic.	70.00%	74.15%
	Use appropriate mathematical notation, processes, and strategies to effectively communicate the solutions of level-appropriate problems in sets and logic.	70.00%	64.86%
MATH 115 Statistics	Analyze and solve level-appropriate problems including concepts of probability, the normal and binomial distributions, confidence intervals, and hypothesis testing for one and two population parameters	70.00%	76.18%
	Use appropriate mathematical notation, processes, and strategies to effectively communicate the solutions of level-appropriate problems in concepts of probability, the normal and binomial distributions, confidence intervals, and hypothesis testing for one	70.00%	69.21%
MATH 116 Intro to Statistics Using R	Analyze and solve level-appropriate problems including concepts of probability, the normal and binomial distributions, confidence intervals, and hypothesis testing for one and two population parameters.	70.00%	88.24%
	Use appropriate mathematical notation, processes, and strategies to effectively communicate the solutions of level-appropriate problems in concepts of probability, the normal and binomial distributions, confidence intervals, and hypothesis testing for one.	70.00%	88.24%
MATH 120 Math for Teachers	Analyze and solve level-appropriate problems using patterns and logic within the real number system, including rational and irrational numbers and different representations.	70.00%	92.31%
	Use appropriate mathematical notation, processes, diagrams (including number lines) and strategies to effectively communicate the solutions of level-appropriate problems within the real number system.	70.00%	78.85%
MATH 124 Finite Math	Analyze and solve level-appropriate problems including matrices, linear systems and programming, variation, normal and binomial distributions, probability, and logic.	70.00%	80.00%
	Use appropriate mathematical notations, processes and strategies to effectively communicate the solutions of level-appropriate problems including matrices, linear systems and programming, variation, normal and binomial distributions, probability, and logic.	70.00%	76.19%
MATH 128 College Algebra for Lib Arts	Analyze and solve level-appropriate problems using patterns and logic within the real number system, including rational and irrational numbers and different representations.	70.00%	62.38%
	Use appropriate mathematical notation, processes, diagrams (including number lines) and strategies to effectively communicate the solutions of level-appropriate problems within the real number system.	70.00%	63.37%
MATH 135 Plane Trigonometry	Analyze and solve level-appropriate problems including the six trigonometric functions, graphs of functions, velocities, identities, areas of triangles, Law of Sines and Cosines, vectors, and the Dot Product.	70.00%	72.50%
	Use appropriate mathematical notation, processes and strategies to effectively communicate the solutions of the appropriate problems with the six trigonometric functions, graphs of functions, identities, areas of triangles, Law of Sines and Cosines, vectors, and the Dot Product.	70.00%	66.88%
MATH 140 Precalculus	Analyze and solve level-appropriate problems including equations, inequalities, and systems involving polynomial, rational, exponential, logarithmic, radical, absolute value, and trigonometric expressions.	70.00%	68.91%
	Use appropriate mathematical notations, processes, and strategies to effectively communicate the solution of level-appropriate problems in equations, inequalities, and systems involving polynomial, rational, exponential, logarithmic, radical, absolute value.	70.00%	59.94%
MATH 148	Analyze and solve level-appropriate problems including Rates of Change, Differentiation and Integration in a business context.	70.00%	100.00%

Calculus for Business & Econ	Use appropriate mathematical notations, processes and strategies to effectively communicate the solutions of level-appropriate problems in Rates of Change, Differentiation and Integration in a business context.	70.00%	96.15%
MATH 150 Calculus & Analytic Geometry	Analyze and solve level-appropriate problems including Limits, Differentiation, and Integration.	70.00%	70.24%
	Use appropriate mathematical notations, processes and strategies to effectively communicate the solutions of level-appropriate problems in Limits, Differentiation and Integration.	70.00%	64.54%
MATH 160 Calculus & Analytic Geometry	Analyze and solve level-appropriate problems including proper and improper integrations, infinite series and sequences, power series, parametric equations, polar coordinates, and conic sections.	70.00%	80.75%
	Use appropriate mathematical notation, processes and strategies to effectively communicate the solutions of the appropriate problems in proper and improper integration, infinite series and sequences, power series, parametric equations, polar coordinates.	70.00%	71.43%
MATH 220 Linear Algebra	Analyze and solve level-appropriate problems in topics including vector space properties, linear transformations, diagonalizations and mathematical proofs.	70.00%	75.76%
	Use appropriate mathematical notations, processes and strategies to effectively communicate the solutions of level-appropriate problems in vector space properties, linear transformations, diagonalizations, including mathematical proofs.	70.00%	64.62%
MATH 230 Intro Ordinary Diff Equations	Use appropriate mathematical notations, processes and strategies to effectively communicate the solutions of level-appropriate problems including first order linear, some nonlinear ordinary differential equations, higher order linear differential equations.	70.00%	75.76%
	Analyze and solve level-appropriate problems in topics including first order linear, some nonlinear ordinary differential equations, higher order linear differential equations, and systems of linear differential equations.	70.00%	86.36%
MATH 250 Calculus & Analytic Geometry	Analyze and solve level-appropriate problems including differentiation and integration of multivariable and vector valued functions, rectangular, cylindrical, and spherical coordinates, and line integrals.	70.00%	91.01%
	Use appropriate mathematical notations, processes and strategies to effectively communicate the solutions of level-appropriate problems including differentiation and integration of multivariable and vector valued functions, rectangular, cylindrical, and spherical coordinates, and line integrals	70.00%	87.64%

Course Improvement Plan Narratives:

1. Utilizing the content of the Action Plan Report and conversations with other faculty, address all SLOs that have met and/or exceeded the expected performance, how can this success be sustained and supported?

Math015: The SLO results for this corequisite class are tied to the SLO results for the corresponding transfer level course.

Math035: The SLO results for this corequisite class are tied to the SLO results for the corresponding transfer level course. Math 110: The performance on SLO1 exceeded the 70% achievement target with just over 74%. This was down from 79% from the prior year. Instructors will continue to emphasize the problem-solving process throughout the course and continue to prepare students to analyze and solve problems effectively.

Math 115: Keep adding additional application problems to provide students more opportunities to refine their problem-solving skills. The performance for SLO1 is still below target (69.21%), whereas the performance for SLO 2 is slightly above target (76.18%) compared to last academic year. SLO1 is getting closer to the target while SLO2 stays above the expectation of 70%. In statistics it is more efficient to use the appropriate statistical software to solve statistical calculations. Increasing student access to computer labs and various statistical software will be helpful. In statistics it is important to put learned concepts into practice and provide opportunities for students' collaboration in both face-to-face and online classes. To help students increase understanding of the challenging statistical concepts and put it in real life applications more project-based work can be implemented in Stats classes. For increasing the collaboration in face-to-face classes, group activities including group projects could be used and for helping students build a community of learners in online classes, discussion boards are a great tool available on Canvas.

Math 116: Both SLO1 and SLO2 exceeded the performance target of 70%. Instructors will continue to model effective problem-solving strategies to continue or increase the level of success on SLO assessments.

Math 120: Both SLO1 and SLO2 exceeded the performance target of 70%. Instructors will continue to model effective problem-solving strategies to continue or increase the level of success on SLO assessments.

Math 124: Both SLO1 and SLO2 exceeded the performance target of 70%. Instructors will continue to model effective problem-solving strategies to continue or increase the level of success on SLO assessments. Math 128: SLO's were all below the expected performance.

Math 135: SLO 1: 72.5% and SLO2: 66.88%. The performance of the first SLO met the 70% target. The second SLO was below the 70% target. This second SLO deals more with interpreting and communicating the results of a problem. More emphasis needs to be placed by faculty on the meaning of the results.

Math 140: SLO 1: 68.91% (from 69.31% the previous year). SLO 2: 59.94% (from 66.01% the previous year) The performance on both SLOs for this course was below the 70% achievement target, and the performance was down for both SLOs from the previous year. Math 148: Both SLOs met 70% achievement target, Math 128 College Algebra as a prerequisite works pretty well.

Math 150: SLO 1: 70.24% The achievement target of 70% was met for analyzing and solving level appropriate problems, which was up from 67% last year. We will continue to encourage students to utilize the available support services to both remediate prerequisite algebraic skills as well as enhance problem solving strategies required for the successful solving of Calculus problems.

Math 160: SLO 1: 80.75% and SLO 2: 71.43%. The performance on both SLOs has met the 70% achievement target.

Math 220: This particular result, a success, may be sustained and supported by as many of the following unproven but sensible pedagogies: informing the students of the challenges they face in the advanced math subject at the beginning of the course; assigning and grading handwritten homework problem solutions for every section being covered; including some challenging problems in homework and providing meaningful critiques to their solutions; assigning fundamental but frequent quizzes to keep them engaged immediately after each lecture; emphasizing on analytic skills instead of rote memorization; giving at least three exams along with the final to test them often in a semester; splitting an exam into two parts in a way that reduces psychological or physical burdens for the students when the testing material is heavy; maintaining the in-person class modality to communicate with the students better and to protect the integrity of the honest students; and encouraging students to actively ask questions within and outside the classroom.

Math 230: Both SLO1 and SLO2 exceeded the performance target of 70%. Instructors will continue to model effective problem-solving strategies to continue or increase the level of success on SLO assessments.

Math 250: Both SLOs continue to meet the 70% achievement target. I have taught this course consistently every semester for the last four years or so and can say that students respond well to written weekly quizzes. In the next class meeting following a quiz (or test), I provide immediate feedback by grading the quizzes (or tests) and posting the solutions. I have found that providing constructive weekly feedback to each student is a great way to build rapport, boost student confidence, and alleviate math anxiety. This in turn has a positive impact on their attitudes and their desire to do better in my class, which in turn translates to better SLO results.

2. Utilizing the content of the Action Plan Report and conversations with other faculty, address all SLOs reporting below the expected performance line. What high-impact practices or other changes can be implemented to improve student performance?

Math 110: The performance on SLO2 65%, which was down from 69% last year. Though students continue to demonstrate reasonable ability solve problems accurately, there continues to be a need for more work to be done in modeling appropriate communication in the problem-solving process. Communication in mathematics is inherently difficult in mathematics, with the focus often being on arriving at the correct answer. More emphasis needs to be placed on what communication looks like in the problem-solving experience and clearly delineate the level of expectation with respect to communication, both in words and use of mathematical symbols.

Math 115: This course will be better taught in a computer lab. SLO1 assesses learner's ability to effectively communicate the solutions of the statistical applications and applications on probability was below the target line (69.21%). Many instructors have realized that groupwork helps to emphasize conceptual understanding, and the addition of tutors in class help the instructor to address the concepts discussed in class. Keep supporting learning in the form of embedded tutors and SI leaders, as well as offering workshops.

Math 116: Not applicable.

Math 120: Not applicable.

Math 124: Not applicable.

Math 128: SLO 1: 62.38% and SLO 2: 63.37% are both below the expected performance rate of 70%. It is noted that many students have issues communicating their solutions to various problems. Many faculty suggest that support courses would be helpful for students, especially since many of them do not have the prerequisite understanding of the material. The support course could highlight pre-college math, such as evaluating expressions and solving equations, so that students can jump into the new material as quickly. This means that we need to increase the units of our class offerings.

Math 135: Doing something with the results after a problem has been completed may help students understand and interpret the results. Creating projects/problems that include doing something with the results of a calculation, comparing results using different iterations to show the different outcomes and their relevance to a specific problem, or simply discussing the results instead of just moving on to a new calculation would help meet the target of the second SLO.

Math 140: We can improve our results by creating more opportunities for students to review algebra skills from the past. This could take a variety of forms -- workshops outside of class, an embedded tutor in the class, handouts for students that address specific algebra skills, and/or a corequisite support course. Some instructors are using videos to beneficial effect, as well.

Math 148: Having students spend more time outside of class redoing the same problems done by instructor helps in improving their test results.

Math 150: The performance on SLO2 was 64.54%, up marginally from last year's 64.16%, but still below the 70% achievement target. We continue to seek ways to encourage students to go to tutoring, attend SI, and access other assistance. Students continue to struggle with prerequisite trigonometric and algebraic skills that become barriers to attaining the calculus concepts being taught, with communication in mathematics often being a foreign concept to many students. We continue work on developing directed learning activities that can be completed in our Math Lab to help with the missing fundamental skills. As a department, we need to do a better job of identifying and encouraging our higher performing students to become tutors in both the learning center and especially as SI representatives.

Math 160: In-person classes help with interaction and general motivation, while in person tests help ensure academic integrity and provide a more accurate reflection of student learning. Daily quizzes help students to pay attention when in class.

Math 220: A few, obvious, practices that can undoubtedly improve their performance on the under-performing SLOs are to offer a course, as a prerequisite or a corequisite, on the subject of basic Logic and to secure qualified tutors at The Learning Center. This subject was once taught in Math 105, Methods of Proofs, which was annihilated so that a new course of the same subject could be offered as the prerequisite to Math 220 – this new course, however, was in turn disappeared before even being offered. Writing a proof, even for the most basic kind of proofs, would be difficult or impossible without basic understanding of Logic. The prerequisite of Math 220 is currently Math 160, Calculus, which is not directly useful in

Math 220: what the students need urgently for Math 220 are strong background in college Algebra, Math 140, and the basic knowledge of logic.

Math 230: Not applicable. Math 250: Adding a corequisite support class to Math 160 might help improve the quality of the weaker students entering Math 250.

3. Indicate any additional resources needed to implement the changes.

Math 110: Recruitment of tutors and SI leaders for Math110 to this point has not been a priority, due to large swings in enrollments in this course. The department has long thought that we should be offering many more sections of Math 110 as there is a sizable population of students that would benefit from this course, major dependent. There appears to be a renewed interest in Math 110, so with this uptick, we need to identify students that are prepared to function as tutors and SIs for this course.

Math 115: More computer labs and graphing calculators. Keep helping students to facilitate free access codes through different entities on campus, including Books H.E.L.P., FYE/SYE program, and other sources. Many students are underprepared for the course due to various reasons including being away from school for a long time, lack of algebra-based concepts needed in statistics, etc. and need more support. Increasing the number of Math 115 courses taught with corequisite unit/s will give better support for those students to succeed in the course. Bringing more tutoring support to students right in the classroom and increasing the number of sections with embedded and SI tutors will be beneficial to all students. Create an FLC group to share the experiences teaching with corequisites. More training is needed for faculty to learn about creating accessible Canvas courses for their online classes or placing accessible material in their Canvas shell for the in-person classes.

It is important that the instructors teaching statistics classes can collaborate with each other and build on best practices. Faculty Learning Community or other professional development activities can be a great way to increase professional collaboration.

Math 116: No additional resources are known at this time.

Math 120: No additional resources are known at this time. Math 124: No additional resources are known at this time.

Math 128: Creating new material is difficult, so the college should provide its instructors with unlimited supplies, such as markers, erasers, paper, and on demand printing, so that the instructors can focus on providing the best education for their students. Students would also benefit from a computer algebra system like Mathematica, to be used for showing concepts and possibly doing more complicated real-world examples, to inspire interest in mathematics, possibly during support times. This should be paid for by the college, so it is free for the students to access.

Math 135: It seems that because the first SLO met its target and the second SLO is very close to achieving its target, we as faculty just need to spend a little more time on the results of a calculation. It is sometime difficult to do this as we are always pressed for time. Support courses or increasing the number of units in this class would go a long way in helping in this endeavor. Math 140: More SI and embedded tutors. Some instructors also would like more classrooms with whiteboards on all the walls and also classroom furniture that better enables group work during class. It might also be helpful to bring in training from outside the college on topics such as teaching co-requisite support classes and facilitating and managing group work in the classroom.

Math 148: No resources needed. Math 150: A larger pool of qualified students to serve as tutors and SI leaders, which is a departmental concern.

Math 160: Students are very unprepared for this course, and they need SI (Student Instructor) and course requisite support.

Math 220: Perhaps The Learning Center can be funded appropriately enough to attract capable students to be tutors or supplemental instructors, though the college's financial situation, which is not widely known to the public, is the deciding factor. A few students, who are qualified to be tutors for Math 220, have once indicated, or implied, that it is not worth being a tutor for the minimum pay, considering the amount of hours and effort being required.

Math 230: No additional resources are required at this time.

Math 250: Perhaps more qualified tutors. I understand that this may not be possible since students who have completed Math 250 will most likely be transferring to a university soon.

Division/Area Name: MSE/Physics	For Planning Years: 2024-2025
Name of person leading this review: Dr. Jason Bowen	
Names of all participants in this review: Dr. Chrysanthos Kyriakides, Dr. Mark McGovern, Dr. Jason Bowen	

Part 1. Program Overview: *Briefly describe how the program contributes to the district mission*
The physics program at Antelope Valley College (AVC) provides a quality education in physics to a diverse population of students through a highly engaging lecture environment, stimulating laboratory activities with new and modern equipment, faculty participation in the STEM Club, faculty participation in undergraduate research projects, and program participation in the joint AVC/California State University Long Beach AV Engineering Program.

Part 2A: Analyze the program review data ([retrieval instructions]), including equity data and any internal/external environmental scan information (e.g., surveys, interviews, focus groups, advisory groups, licensure exam scores, & job placement) to identify the program Strengths, Opportunities & Aspirations:
Use the following questions to guide your analysis:
Overall (Use the *Program Review* tab to inform your analysis)
• What are the success and retention rates (S&R) for your discipline? Did they decrease or increase in the last year?
• What are the trends for the number of awards granted? Are the number of awards going up or down?
Equity (Use the *S & R by Demographic Group* or the *Equity* tab to inform your analysis)
• Which racial/ethnic student groups complete their courses at the highest rates?
• Which racial/ethnic student groups experience the largest gaps when compared to the highest-performing group? Analyze the trends across the last review period. If no equity gaps are present, please reflect on the strategies that are working in the *Strengths and Accomplishments* section.
Strengths and Accomplishments: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*
The overall success rate has improved over the prior cycle and is larger than the college average at 79.2%, an increase over the prior cycle of 77.1%. The overall retention rate remains lower than the college average, however, has improved by two percentage points and is 85.7% in the current cycle. The retention rate for female students remains flat at 83.6%, however a percentage point increase in the success rate for female students was observed where the success rate is now 78.4%. Male students saw a marked increase in both retention and success rates of three percentage points, or 87.5% and 79.9%, respectively. Retention rates for both male and female students are lower than the college averages however success rates for both demographics exceeds the college average. Hispanic/Latinx and White Non-Hispanic students saw increases in both retention and success rates. All rates for these two demographics exceed the college averages save for Hispanic/Latinx retention rates which remain below the college average.
Opportunities and Challenges: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*
The overall retention rate remains lower than the college average, however, has improved by two percentage points and is 85.7% in the current cycle. An opportunity exists to increase total retention rates. Total enrollment continues to decline. The total number of sections offered in the 2022-2023 academic year has declined from 24 sections to 20 sections with total enrollment decreasing from 484 students to 442 students. The retention rate for female students remains flat at 83.6%, however a percentage point increase in the success rate for female students was observed where the success rate is now 78.4%. Retention rates for both

male and female students remain lower than the college average. Hispanic/Latinx retention rates also remain below the college average. Hispanic/Latinx, African America/Black, and Two or more races have retention rates all below the college average. White Non-Hispanic and Other are the only demographics which have retention rates which exceed the college average. The success rate for White Non-Hispanic improved substantially from 82.2% to 90.6% and exceeds the college average. African American/Black students saw sharp declines in both retention and success rates and stand at 70.6% and 64.7%, respectively and are below the college averages, where in the prior cycle African American/Black students had a success rate of 75% which was above the college average. The persistent challenge in the current environment is restoring retention and success rates to pre-pandemic levels. An opportunity exists to identify the reasons for the improvements observed in the African American populations and apply appropriate remedies to improve overall student performance. Additional ongoing challenges due to the post-COVID-19 environment and continuing socio-economic challenges may continue to depress retention and success rates or stall recovery to pre-pandemic levels.

Aspirations: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*

Achieve parity in performance across all demographics and achieve pre-pandemic retention, success rates and enrollments. Increase rate of transfer to four-year universities and the joint CSULB/AVC Engineering Program. Support the STEM Club and associated extracurricular activities. Promote student confidence, success, and belief that full academic potential and career goals can be realized. Encourage students to make the world a better place for all of us.

Part 2B: (Required for CTE) External Data: Advisory Committee Recommendations & Labor Market Data
Insert Advisory Committee Recommendations here (Please do not insert complete meeting minutes, but just recommendations from the advisory committee.)
Insert Labor Market Data here https://www.labormarketinfo.edd.ca.gov/commcolleges/

Part 2C: Review and comment on progress toward past Course Improvement Plans

The SLO assessments in Fall 2022 for PHYS 101, 110, 120 and 211 for SLO 1 and 2 are, respectively: 92.5% and 82.5%, 76.9% and 69.2%, 75% and 78.1%, and 66.7% and 88.9%. For Spring 2023 the assessments are, again respectively: 87.5% and 87.5%, 73.5% and 58.8%, 82.9% and 68.6%, and 71.4% and 71.4%. No data is provided for PHYS 102 in Fall 2022. In Spring 2023 SLO assessments are 95% and 90%, for PHYS 102. The proposed action in the prior Course Improvement Plan cycle called for monitoring student conceptual understanding in real time using clickers and emphasizing the solving of problems of a conceptual nature. Additional emphasis on providing real-life demonstrations of physics concepts in class was also encouraged. The introduction of clickers appears to have enhanced engagement and learning. This is evident in PHYS 101 where substantial improvements in performance were observed. Marginal failures in performance standards is observed in PHYS 110 and 211 in effective communication however efforts are ongoing, though we note substantial improvements in conceptual understanding in PHYS 110. In addition, the introduction of additional physics demonstrations continues to foster enthusiasm and focus on the material taught improving analytical problem-solving ability, in addition to high quality visual descriptions of the geometry presented in class. Visual aids are emphasized in PHYS 120 and 211, where in PHYS 120 expected performance was exceeded. Performance targets were met in PHYS 211 in one category and a marginal failure to meet performance standards was observed in the second SLO category, like the prior cycle, however we expect continued use of active learning methods to yield improvements, given that an increased emphasis on visual learning tools seems to enhance student ability to solve problems through active learning and engagement. The emphasis on greater utilization of visual learning aids appears to improve learning outcomes. It was noted in past cycles that a return to in-person learning has had a dramatic effect on student ability to process abstract concepts. Visual learning tools will continue to be used to promote active learning and in-person learning encouraged as online learning environments appear to have a detrimental effect on student ability to grasp complex ideas.

Past Course Improvement Plans	Progress Made
Use of clickers to access student understanding in real-time	Substantial increase in PHYS 101 performance in both categories
Use of real-life/virtual demonstrations in class	Continuing to monitor; improvements in PHYS 211 SLO 2 performances
Emphasis on conceptual problems	Substantial increase in PHYS 110 conceptual performance
Active learning methods	Significant improvement in PHYS 102 performance; continuing to monitor

Part 2D: Review and comment on progress towards past program review goals:

Goals defined in the prior program review cycle include increasing student success and retention rates to pre-pandemic levels and increasing the number of AS-T degrees awarded to pre-pandemic levels. In the 2021-2022 academic year the retention and success rates were, respectively, 83.7% and 77.1%. In the 2022-2023 academic year the retention and success rates increased to 85.7% and 79.2%, respectively. Retention and success rates have not been restored to pre-pandemic levels in the current program review cycle however we are hopeful and note that the 2022-2023 academic year is one year removed from the first full academic year following the pandemic in which all physics course instruction was offered face-to-face. It remains difficult accessing and accounting for the lingering effects of the fully online environment implemented during the 2020-2021 academic year and the pandemic's continuing economic impact on student performance however we are hopeful. The data contained in the current program review cycle will provide illuminating insights into expected long-term trends and trajectories of student performance, success, and retention. For example, we observe that the absolute number of AS-T Physics degrees awarded declined from 25 to 20, and that the rate of AS-T Physics degrees awarded decreased to from 4.52% from 5.15%. We note that enrollments continue to fall. Improving enrollments may have a positive impact on our program goals.

Past Goal	Progress Made
Increase student retention rates to pre-pandemic levels	Retention rates improved by two percentage points

Increase student success rates to pre-pandemic levels	Success rates improved by two percentage points
Increase AS-T degrees to pre-pandemic levels	AS-T degrees decline to 20 from 25; AS-T rate declined to 4.52% from 5.15%

Part 3: Based on Part 2 above, please list program/area goals for 2023-2024:							
Program /Area Goal #	Goal Supports which:				ESP Goal Primarily Supported:	Goal (Student-focused)	Steps to be taken to achieve the goal?	Measure of Success (How would you know you've achieved your goal?)
	ILO	PLO	SLO	OO				
#1	ILO 2. Creative, Critical, and Analytical Thinking				Goal 1: Commitment to strengthening institutional effectiveness measures and practices	Increase student retention rates to pre-pandemic levels	Increase student retention rates to pre-pandemic levels Increase communication channels to promote in-person interventions by: (1) state clearly the first day of class the anticipated challenges some students will face due to societal obstacles persisting following the COVID-19 pandemic and economic challenges, (2) encourage students that the challenges can be overcome, (3) direct students to the relevant	Review Program Review data
#2	ILO 2. Creative, Critical, and Analytical Thinking				Goal 1: Commitment to strengthening institutional effectiveness measures and practices	Increase student success rates to pre-pandemic levels	(1) Identify poor performing students using test scores, homework scores, and laboratory scores, (2) Contact students and arrange a meeting, (3) Identify the specific challenges preventing satisfactory academic performance, (4) Determine a plan including increasing the number solved	Review Program Review data

						problems presented in class, meeting with a tutor in the learning center, seeing the instructor regularly during office hours to review the material, etc.	
#3	ILO 4. Career and Specialized Knowledge				Goal 3: Focus on utilizing proven instructional strategies that will foster transferable intellectual skills	Increase the number of AS-T degrees to pre-pandemic levels	Increase retention and success rates, and enrollments	Review Program Review data
#4	ILO 3. Community /Global Consciousness				Goal 5: Align instructional programs to the skills identified by the labor market	Increase enrollment and sections offered	Promote joint AVC/CSULB Engineering Program	Review Program Review data

Part 4: Resource Requests that Support Program Goals (Based on the above analysis, please use the following space to document resource requests)

Type of Resource Request	Summary of Request	Which of your Program/area goals (Part 3) does this request support?	New or Repeat Request	Amount of Request, ($)	One-Time or Recurring Cost, ($)	Contact's Name
Faculty	Funding for adjunct faculty	Increasing enrollment and sections offered	New	100000	Recurring	Dr. Jason Bowen
Technology	Oscilloscopes	Providing skills and increasing enrollment	Repeat	15000	One-time	Dr. Jason Bowen
Other	Stipend for outreach	Increasing enrollment	New	10000	Recurring	Dr. Jason Bowen
Faculty	Funding for full-time faculty	Increasing enrollment and sections offered	Repeat	250000	Recurring	Dr. Jason Bowen
Professional development	Funding for travel/conferences	Increase number of AS-T degrees	Repeat	15000	Recurring	Dr. Jason Bowen

***REQUIRED: After gathering the information above, fill out your RESOURCE REQUESTS to be shared with the Budget Committee:
https://www.surveymonkey.com/r/2023PR_ResourceRequest

Part 5: Insert your Program Review Data here and any other supporting data. (See Part 2A above).
Required:
- Program Review tab
- S&R by Demographic Groups tab

Optional:
- Other supporting data/information

Select Subject	Select Subject again	Select Program Major(s)	Academic Year
PHYS	PHYS	AS-T Physics (PHYT)	Multiple values

Retention, Success, Number of Sections, & Enrollment in PHYS (Total AVC rates are shown as │ *hover over to see data*)

PHYS	Subject vs. AVC Retention Rate	Subject vs. AVC Success Rate	# of Sections	Enrollment (Dupl.), no EWs
2019-2020	94.8%	87.5%	26	594
2020-2021	86.6%	80.6%	25	589
2021-2022	83.7%	77.1%	24	484
2022-2023	85.7%	79.2%	20	442

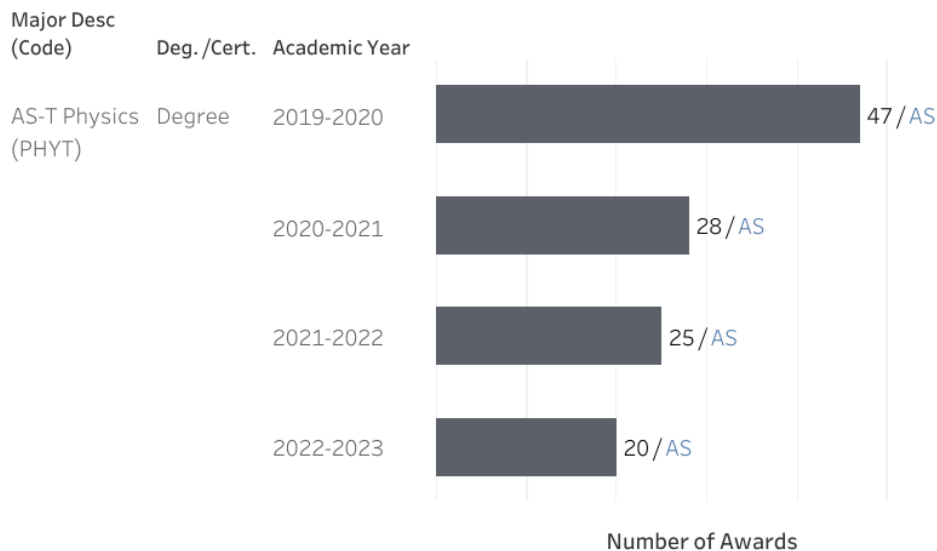## Enrollment and Number of Sections by *Modality* in PHYS

	Instr. Method	2019-2020	2020-2021	2021-2022	2022-2023
Number of Sections	Other Indep Study			1	
	Traditional	26	25	23	20
Enrollment	Other Indep Study			2	
	Traditional	607	589	483	442

Enrollment and Number of Sections by *Location* in PHYS

	Location	2019-2020	2020-2021	2021-2022	2022-2023
Number of Sections	Lancaster	26	25	24	20
Enrollment	Lancaster	607	589	485	442

Number of Program Awards in AS-T Physics (PHYT)

Major Desc (Code)	Deg./Cert.	Academic Year	Number of Awards
AS-T Physics (PHYT)	Degree	2019-2020	47 / AS
		2020-2021	28 / AS
		2021-2022	25 / AS
		2022-2023	20 / AS

FTEF by Contract Type, Part-time/Full-time Ratio, FTES, FTES/FTEF in PHYS

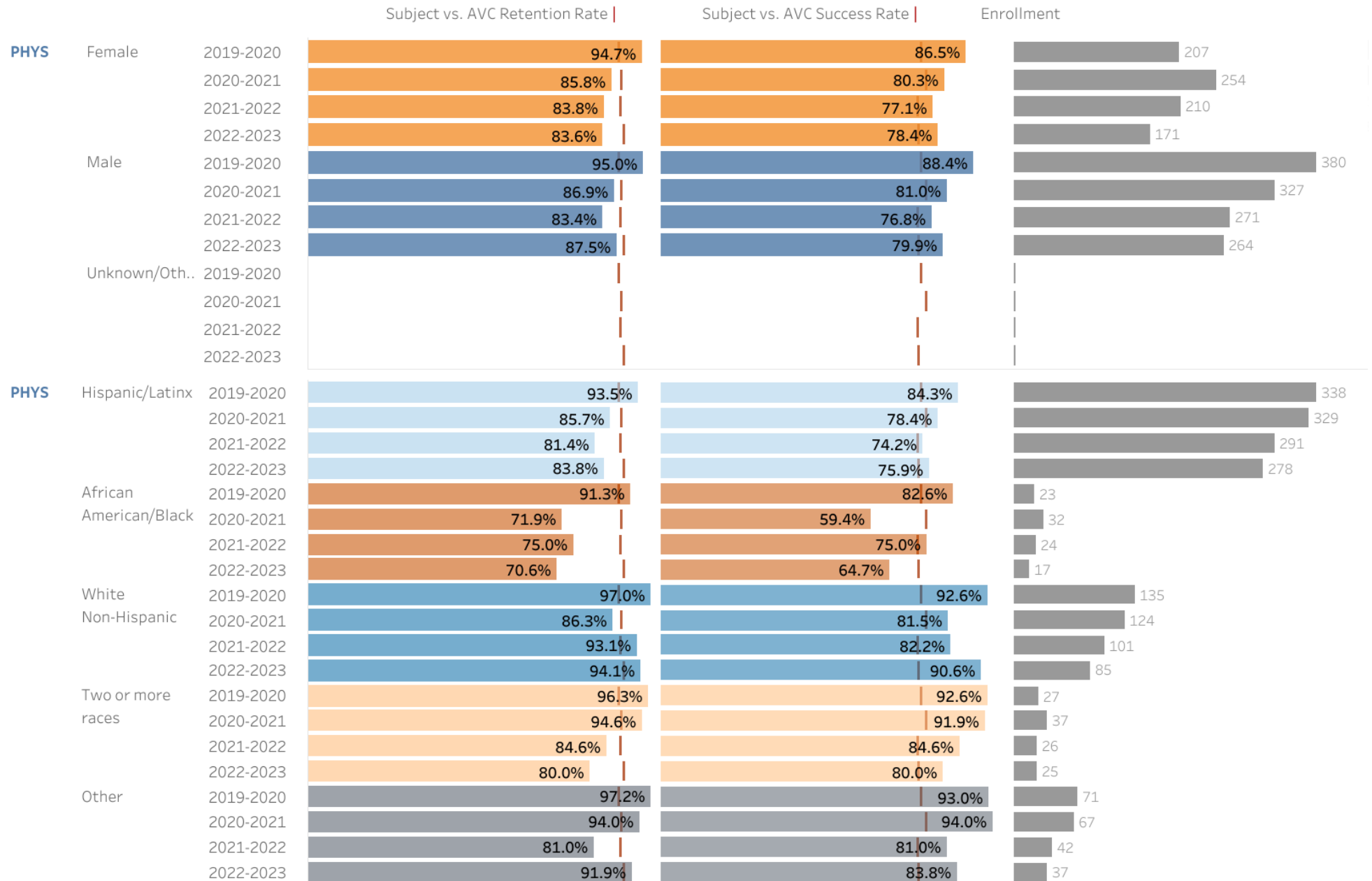|	Fall 2019	Fall 2020	Fall 2021	Fall 2022
PT (Adjunct) FTEF	0	1	0	0
FT (Regular) FTEF	3	3	2	2
FT (Overload) FTEF	1	1	1	1
TOTAL FTEF	4	4	4	4
PT/FT FTEF Ratio	0	0	0	0
FTES	53	55	43	48
FTES/FTEF Ratio	12	13	11	12
WSCH/FTEF Ratio	367	384	334	372
WSCH	1,591	1,652	1,293	

Click here
to see AVC's Program
awards dashboard

Last Update: 09/30/2022 .Data Sources: AVC's Banner, ARGOS reports

Subject-Level Retention Rate (RR), Success Rate (SR), and Enrollment by Sex & Race/Ethnicity as Compared to AVC's Rates (|)

If the Subject bars are below the vertical lines | , it indicates that equity gaps exist in SR or RR for those sub-groups as compared to overall SS or RR. Some questions to ask when looking at the data:
- What are the potential reasons for equity gaps? - What can my program implement to mitigate these gaps? (Consider such factors as curriculum design, teaching methods, campus climate, and support services.) - What resources/training are available/needed to support these efforts?

			Subject vs. AVC Retention Rate |	Subject vs. AVC Success Rate |	Enrollment
PHYS	Female	2019-2020	94.7%	86.5%	207
		2020-2021	85.8%	80.3%	254
		2021-2022	83.8%	77.1%	210
		2022-2023	83.6%	78.4%	171
	Male	2019-2020	95.0%	88.4%	380
		2020-2021	86.9%	81.0%	327
		2021-2022	83.4%	76.8%	271
		2022-2023	87.5%	79.9%	264
	Unknown/Oth..	2019-2020			
		2020-2021			
		2021-2022			
		2022-2023			
PHYS	Hispanic/Latinx	2019-2020	93.5%	84.3%	338
		2020-2021	85.7%	78.4%	329
		2021-2022	81.4%	74.2%	291
		2022-2023	83.8%	75.9%	278
	African American/Black	2019-2020	91.3%	82.6%	23
		2020-2021	71.9%	59.4%	32
		2021-2022	75.0%	75.0%	24
		2022-2023	70.6%	64.7%	17
	White Non-Hispanic	2019-2020	97.0%	92.6%	135
		2020-2021	86.3%	81.5%	124
		2021-2022	93.1%	82.2%	101
		2022-2023	94.1%	90.6%	85
	Two or more races	2019-2020	96.3%	92.6%	27
		2020-2021	94.6%	91.9%	37
		2021-2022	84.6%	84.6%	26
		2022-2023	80.0%	80.0%	25
	Other	2019-2020	97.2%	93.0%	71
		2020-2021	94.0%	94.0%	67
		2021-2022	81.0%	81.0%	42
		2022-2023	91.9%	83.8%	37

Division/Area Name: Mathematics, Science, & Engineering / Physical Science	For Planning Years: 2024-2025
Name of person leading this review: Dr. Mark McGovern	
Names of all participants in this review: Dr. Mark McGovern	

Part 1. Program Overview: *Briefly describe how the program contributes to the district mission*
Physical Science courses provide the students of AVC with quality science education within a positive and inclusive learning environment which is dedicated to developing student understanding and appreciation of the relevancy of the physical sciences. PSCI 101 is a general education course that combines physics and chemistry content and is mainly geared towards students who intend to become K-12 teachers. The curriculum includes a hands-on active-learning laboratory component designed to improve students' conceptual understanding and problem-solving ability. The PSCI 302 course has been designed to meet the needs of the AVC 4-year airframe manufacturing technology program. It is a required class that introduces students to a non-calculus quantitative understanding of the atmosphere through the study of atmospheric thermodynamics and dynamics.

Part 2A: Analyze the program review data (retrieval instructions), including equity data and any internal/external environmental scan information (e.g., surveys, interviews, focus groups, advisory groups, licensure exam scores, & job placement) to identify the program Strengths, Opportunities & Aspirations:

Use the following questions to guide your analysis:
Overall (Use the *Program Review* tab to inform your analysis)
    • What are the success and retention rates (S&R) for your discipline? Did they decrease or increase in the last year?
    • What are the trends for the number of awards granted? Are the number of awards going up or down?
Equity (Use the *S & R by Demographic Group* or the *Equity* tab to inform your analysis)
    • Which racial/ethnic student groups complete their courses at the highest rates?
    • Which racial/ethnic student groups experience the largest gaps when compared to the highest-performing group? Analyze the trends across the last review period. If no equity gaps are present, please reflect on the strategies that are working in the *Strengths and Accomplishments* section.

Strengths and Accomplishments: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*
Retention rates over the four years of 2019-20 to 2022-23 have remained high (~ 95%). Success rates have increased over the same four-year period and peaked this past academic year at 91.8%. During this time, the program has remained well above the college average retention and success rates. Regarding equity data, success and retention rates by sex are relatively high (~90%) and sit at or above the college average. The highest rates for success and retention for race/ethnicity are found among Hispanic/Latinx (96% this past year) and White Non-Hispanic (also 96% this past year). Sections taught at the Lancaster main campus generally are filled. The presence of a full-time physical science lab technician has been essential for the continued success of the area by maintaining current equipment and purchasing new equipment. Students completing PSCI 302 are moving toward their goal of a bachelor's degree in AVC's 4-year airframe manufacturing technology program. The discipline is proud to support this program. It was identified a couple of years back that textbook materials were insufficient to meet the educational needs of the students and made student engagement difficult. They have been replaced over time by AVC faculty writing their own labs and lecture materials. We attribute much of our success to the high-quality custom material being developed for our students.

Opportunities and Challenges: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*
We have had a difficult time finding a permanent full-time instructor for physical science as our previous one moved to a different state. We hired a full-time temporary instructor last year, but they sadly passed away before the start of this current academic year. As a result, we had to cancel all PSCI 101 classes as we could not fill the instruction vacancy. A recent call to hire faculty for this position was fruitless. A new call will be made this year to hopefully fill the full-time vacancy. A major challenge the discipline faces was revealed in the equity program review data. Over the past several years, the discipline has seen low success rates (63.6% this past year) for African American/Black groups which sits almost ten points lower than the college average. The faculty will review instructional material and methods to ensure we are providing an equitable educational experience for all students. Additionally, faculty professional development training on equity in education will be a valuable resource that we hope can help us close these gaps. Enrollment has dropped over the last four years with the most notable drop being this most recent year. We saw enrollment go down by more than half from the numbers we had two years ago. A major challenge we face is finding instructional support to allow enrollment numbers to increase. We desire to provide students with the most up-to-date equipment and technology and improve the quality of laboratory exercises to maintain the high levels of student success that we are currently seeing.
Aspirations: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*
We are looking to increase our presence at the Palmdale campus. We have a fully equipped lab at the Palmdale campus, but enrollment has been consistently low or not available. Additionally, we aspire to properly identify and close all equity gaps among our students.

Part 2B: (Required for CTE) External Data: Advisory Committee Recommendations & Labor Market Data
The physical science discipline does not have an Advisory Committee. The satisfaction of students surveyed in our classes during the past academic year revealed that the majority felt somewhat or very satisfied with the content of the courses.
The labor market data related to the physical science curriculum of PSCI 101 falls under the category of Secondary School Teachers, Except Special and Vocational Education. It is estimated that there are approximately 25,860 job openings annually in Los Angeles County. The labor market data related to the physical science curriculum of PSCI 302 falls under two categories: Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary and Geoscientists, Except Hydrologists and Geographers. It is estimated that there are approximately 400 and 740 annual job openings, respectively, in Los Angeles County.

Part 2C: Review and comment on progress toward past Course Improvement Plans

List your past **Course Improvement Plans** (CIP) and progress toward meeting those plans.

Past Course Improvement Plans	Progress Made
PSCI 101 Maintaining High Achievements - The performance on SLO 1 and SLO 2 was target met or exceeded with an 86% rate for both. While this is an excellent rate for students to have met and achieved the target it is a decline from the previous year when targets were met at a near 95% rate.	In the past academic year, a new assessment was introduced to students as faculty felt that the previous one may not have been reflective of the true success of the students. The result continued to remain positive with the new assessment. The lab and lecture materials provide good information that is taught effectively and applied by the students. The hands-on labs and learning experiences with the current equipment seem to be working and helping the students to comprehend these basic physics processes. There seems to be no need for any drastic change as the data shows the excellent achievement of the SLO. We will continue to monitor the performance and make sure we have enough instructional support and modern laboratory equipment to maintain these results.
PSCI 302 Ensuring SLO Data Collection - Regarding PSCI 302, assessment data for the past academic year is not available to analyze.	Faculty will ensure that proper assessment, data collection, and reporting will occur in this upcoming cycle. One of the objectives of this course is to enhance the student's quantitative ability to apply their knowledge of physics to understand the processes used to analyze atmospheric conditions related to various weather systems. This requires a review of the relevant physical processes to derive the equations of motion, thermodynamic equation, and the continuity equation. Discipline faculty will rewrite the SLO so that there is more time to review the basics of physics dynamics and thermodynamics by limiting the course to those topics. This means that any discussion of physical meteorology is restricted to the atmospheric phenomena that are analyzed in each case including the introduction of the relevant principles of physical meteorology to those cases. The first half of the course is focused on the basics, supported by an expanded number of problems designed to challenge the student to increase their understanding. The second half of the course is focused on applying analytical tools to various atmospheric phenomena. The second half of the course is supplemented with selected lectures from UCLA's Department of Atmospheric Sciences to complement the lectures that AVC faculty offer.

Part 2D: Review and comment on progress towards past program review goals:

List your past program review goals and progress towards those goals.

Past Goal	Progress Made
#1 – Laboratory Quality	For this goal we were looking to improve the quality of activities used for instruction. Faculty in the discipline were consulted and in combination with SLO data several changes were made to the material. Future SLO data will reveal if these changes were successful.
#2 – Full time Instructor	No progress was made. We put out a job announcement for the position but did not get enough of a response to justify interviews. We will put out another call this coming winter.

Part 3: Based on Part 2 above, please list program/area goals for 2023-2024:

Program /Area Goal #	Goal Supports which:				ESP Goal Primarily Supported:	Goal (Student-focused)	Steps to be taken to achieve the goal?	Measure of Success (How would you know you've achieved your goal?)
	ILO	**PLO**	**SLO**	**OO**				
#1 – Increase offerings	ILO 1. Communication				Goal 2: Increase efficient and effective use of resources: Technology; Facilities; Human Resources; Business Services	Increase the number of sections of PSCI 101 offered at both the Lancaster and Palmdale campus.	Ensure we have enough instructional support to offer additional sections through both full-time and adjunct hires. Also, make sure the Palmdale campus is fully capable of supporting lab activities.	The number of sections and therefore overall enrollment numbers will increase.
#2 – Full time Instructor	ILO 1. Communication				Goal 2: Increase efficient and effective use of resources: Technology; Facilities; Human Resources; Business Services	Maintain the high quality of education with the inclusion of a faculty member fully devoted to the discipline.	Hire a full-time faculty member	We see the successful hire of a full-time faculty member in physical science.

#3 – Laboratory Quality	ILO 2. Creative, Critical, and Analytical Thinking		ALL		Goal 2: Increase efficient and effective use of resources: Technology; Facilities; Human Resources; Business Services	Improve the quality of laboratory equipment used in the activities used to teach physical science.	Identify outdated equipment and find suitable replacements. Additionally, check current distributors of lab equipment and determine if any new would help support the instructional goals of the discipline.	Acquisition and implementation of new equipment. We look to see that SLOs target remain at their current high level or even improve.
#4	Choose ILO				Choose an item.			

Part 4: Resource Requests that Support Program Goals (Based on the above analysis, please use the following space to document resource requests)

Type of Resource Request	Summary of Request	Which of your Program/area goals (Part 3) does this request support?	New or Repeat Request	Amount of Request, ($)	One-Time or Recurring Cost, ($)	Contact's Name
Faculty	Hire a full-time faculty member	Goal #1, 2	New	$65,000 – 80,000	One-time	Jedidiah Lobos (Dean), Alexandra Schroer (Chair)
Technology	New laptops	Goal #3	New	$15,000	One-time	Jedidiah Lobos (Dean), Alexandra Schroer (Chair), David Bermea (Lab Tech)
Physical/Facilities	Have room darkening window blinds installed in PSCI room UH239	Goal #3	New	?	One-time	Jedidiah Lobos (Dean), Alexandra Schroer (Chair)
Supplies	On-going budget to upgrade, replace, and acquire new equipment for the labs and demonstrations.	Goal #3	Repeat	$5,000	Recurring	Jedidiah Lobos (Dean), Alexandra Schroer (Chair), David Bermea (Lab Tech)
Professional development	Budget to attend national conferences where research and teaching ideas are shared.	Goal #3	New	$2,000	Recurring	Jedidiah Lobos (Dean), Alexandra Schroer (Chair)

***REQUIRED: After gathering the information above, fill out your RESOURCE REQUESTS to be shared with the Budget Committee:
https://www.surveymonkey.com/r/2023PR_ResourceRequest

Part 5: Insert your Program Review Data here and any other supporting data. (See Part 2A above).
Required:
- Program Review tab
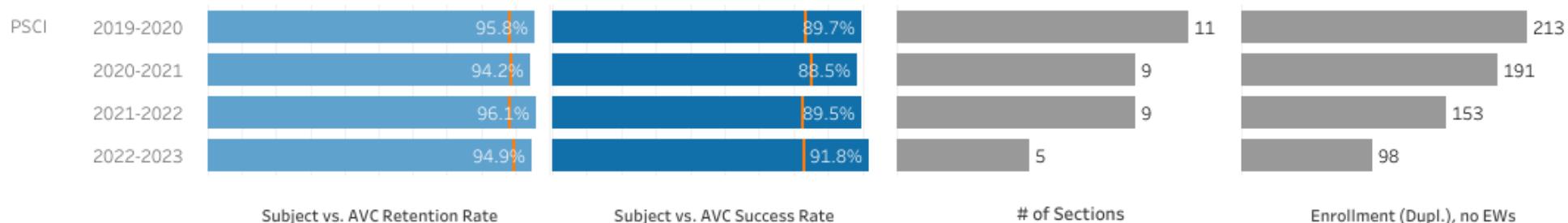- S&R by Demographic Groups tab

Optional:
- Other supporting data/information

Please Select **Subject** area (twice) and **Program Major(s)** to get your data -->

| Select Subject PSCI | Select Subject again PSCI | Select Program Major(s) Multiple values | Academic Year Multiple values |

Retention, Success, Number of Sections, & Enrollment in PSCI (Total AVC rates are shown as │ *hover over to see data*)

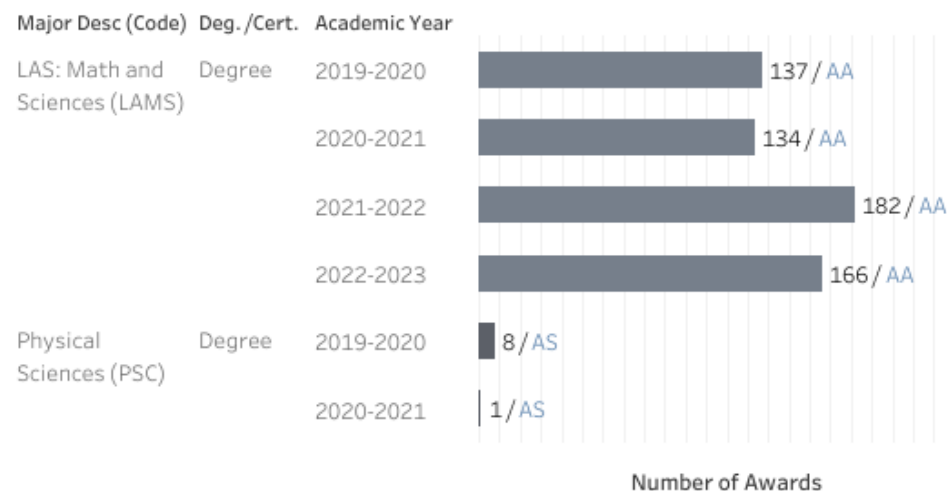| PSCI	Subject vs. AVC Retention Rate	Subject vs. AVC Success Rate	# of Sections	Enrollment (Dupl.), no EWs
2019-2020	95.8%	89.7%	11	213
2020-2021	94.2%	88.5%	9	191
2021-2022	96.1%	89.5%	9	153
2022-2023	94.9%	91.8%	5	98

Enrollment and Number of Sections by *Modality* in PSCI

	Instr. Method	2019-2020	2020-2021	2021-2022	2022-2023
Number of Sections	Other Indep Study	1			
	Traditional	10	9	9	5
Enrollment	Other Indep Study	1			
	Traditional	216	191	153	99

Enrollment and Number of Sections by *Location* in PSCI

	Location	2019-2020	2020-2021	2021-2022	2022-2023
Number of Sections	Lancaster	9	7	8	4
	Palmdale	2	2	1	1
Enrollment	Lancaster	175	160	137	76
	Palmdale	42	31	16	23

Number of Program Awards in LAS: Math and Sciences (LAMS) & Physical Sciences (PSC)

Major Desc (Code)	Deg./Cert.	Academic Year	Number of Awards
LAS: Math and Sciences (LAMS)	Degree	2019-2020	137 / AA
		2020-2021	134 / AA
		2021-2022	182 / AA
		2022-2023	166 / AA
Physical Sciences (PSC)	Degree	2019-2020	8 / AS
		2020-2021	1 / AS

FTEF by Contract Type, Part-time/Full-time Ratio, FTES, FTES/FTEF in PSCI

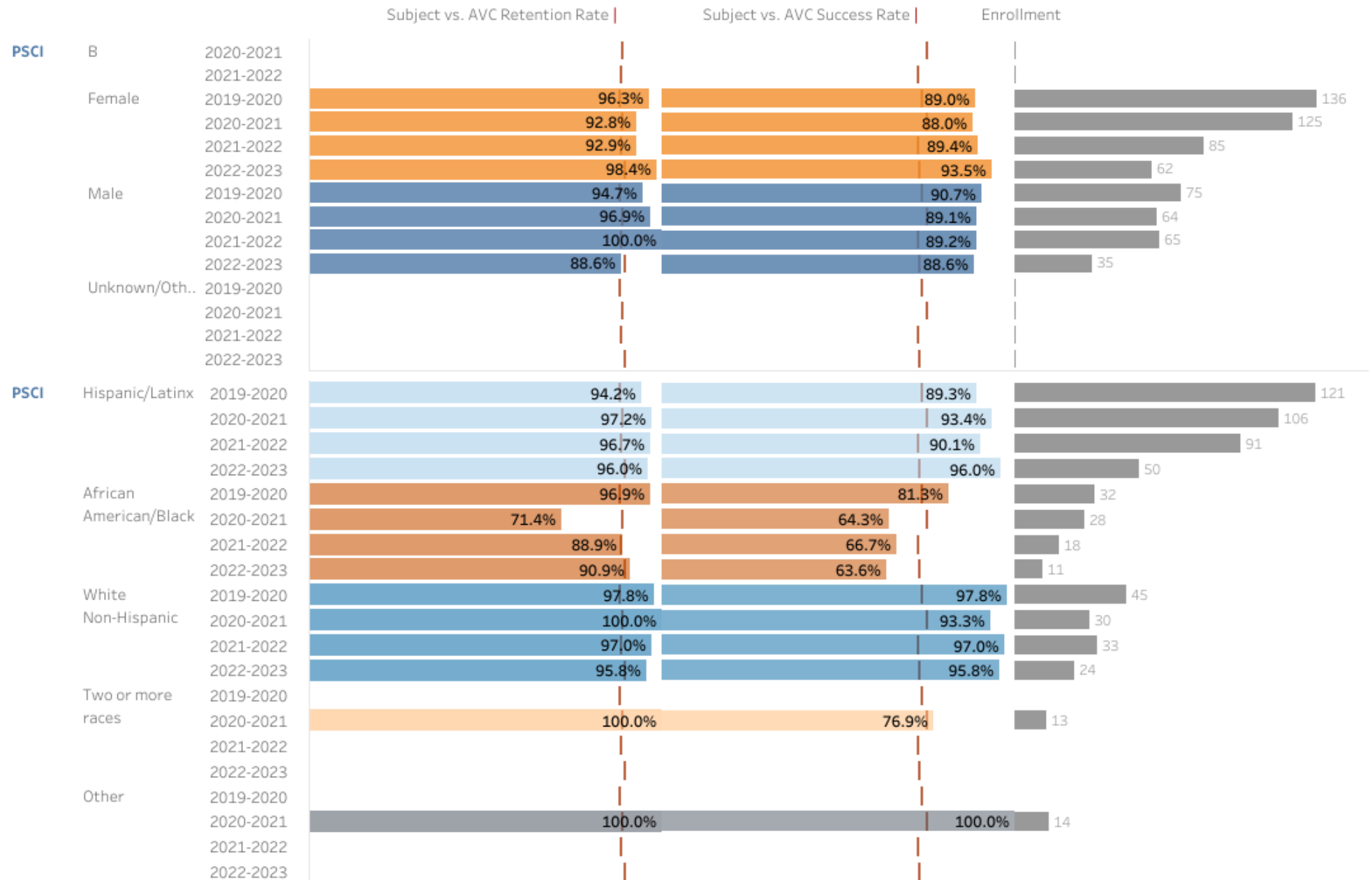|	Fall 2019	Fall 2020	Fall 2021	Fall 2022
PT (Adjunct) FTEF	1.0	1.0	0.2	0.6
FT (Regular) FTEF	0.8	0.8	0.8	
FT (Overload) FTEF			0.4	
TOTAL FTEF	1.8	1.8	1.4	0.6
PT/FT FTEF Ratio	1.3	1.3	0.3	
FTES	21.0	20.1	13.9	9.2
FTES/FTEF Ratio	11.7	11.2	9.9	15.3
WSCH/FTEF Ratio	350.5	335.0	297.6	460.0
WSCH	630.9	603.0	416.7	

Click here
to see AVC's Program awards dashboard

Subject-Level Retention Rate (RR), Success Rate (SR), and Enrollment by Sex & Race/Ethnicity as Compared to AVC's Rates (|)

If the Subject bars are below the vertical lines | , it indicates that equity gaps exist in SR or RR for those sub-groups as compared to overall SS or RR. Some questions to ask when looking at the data:
- What are the potential reasons for equity gaps? - What can my program implement to mitigate these gaps? (Consider such factors as curriculum design, teaching methods, camp climate, and support services.) - What resources/training are available/needed to support these efforts?

			Subject vs. AVC Retention Rate	Subject vs. AVC Success Rate	Enrollment
PSCI	B	2020-2021			
		2021-2022			
	Female	2019-2020	96.3%	89.0%	136
		2020-2021	92.8%	88.0%	125
		2021-2022	92.9%	89.4%	85
		2022-2023	98.4%	93.5%	62
	Male	2019-2020	94.7%	90.7%	75
		2020-2021	96.9%	89.1%	64
		2021-2022	100.0%	89.2%	65
		2022-2023	88.6%	88.6%	35
	Unknown/Oth..	2019-2020			
		2020-2021			
		2021-2022			
		2022-2023			
PSCI	Hispanic/Latinx	2019-2020	94.2%	89.3%	121
		2020-2021	97.2%	93.4%	106
		2021-2022	96.7%	90.1%	91
		2022-2023	96.0%	96.0%	50
	African American/Black	2019-2020	96.9%	81.3%	32
		2020-2021	71.4%	64.3%	28
		2021-2022	88.9%	66.7%	18
		2022-2023	90.9%	63.6%	11
	White Non-Hispanic	2019-2020	97.8%	97.8%	45
		2020-2021	100.0%	93.3%	30
		2021-2022	97.0%	97.0%	33
		2022-2023	95.8%	95.8%	24
	Two or more races	2019-2020			
		2020-2021	100.0%	76.9%	13
		2021-2022			
		2022-2023			
	Other	2019-2020			
		2020-2021	100.0%	100.0%	14
		2021-2022			
		2022-2023			

Division/Area Name: MSE/Water Distribution and Treatment Operations	For Planning Years: 2024-2025
Name of person leading this review: Jedidiah Lobos	
Names of all participants in this review: Jedidiah Lobos	

Part 1. Program Overview: *Briefly describe how the program contributes to the district mission*
The Water Treatment classes are a unique set of classes that were developed by and offered at the request of the local water agency with the single goal of preparing students for the state licensing test. The curriculum was developed and is taught by two local water specialists who are employed by the water agency and are qualified to be adjuncts at AVC.

Part 2A: Analyze the program review data (retrieval instructions), including equity data and any internal/external environmental scan information (e.g., surveys, interviews, focus groups, advisory groups, licensure exam scores, & job placement) to identify the program Strengths, Opportunities & Aspirations:
Use the following questions to guide your analysis: Overall (Use the *Program Review* tab to inform your analysis)   • What are the success and retention rates (S&R) for your discipline? Did they decrease or increase in the last year?   • What are the trends for the number of awards granted? Are the number of awards going up or down?   Equity (Use the *S & R by Demographic Group* or the *Equity* tab to inform your analysis)   • Which racial/ethnic student groups complete their courses at the highest rates?   • Which racial/ethnic student groups experience the largest gaps when compared to the highest-performing group? Analyze the trends across the last review period. If no equity gaps are present, please reflect on the strategies that are working in the *Strengths and Accomplishments* section.
Strengths and Accomplishments: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*
By taking only three classes the students can prepare for various grade-level water treatment and or distribution examinations administered by the California Water Resources Control Board. Certifications are required by the Safe Drinking Water Act for anyone that operates distribution and/or treatment systems that may affect water quality. Generally, this applies to all field employees other than entry-level positions.
Opportunities and Challenges: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*
As our population in Southern California increases, the demand for water service also continues to increase. At the same time our population ages, the rate of retirements has increased. This, in turn, has dramatically increased the demand for labor in the water utility fields. The classes are not well advertised, mainly passing by word of mouth at the local water agencies, and it can benefit from full time faculty supervision. Advertising directly to local water agencies via an email list may be a way to make direct contacts and target an already known audience. Perhaps utilizing the electronic marquee can also generate more buzz in regard to these classes.

Aspirations: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*
At some point, it would be beneficial to develop at least a local certificate incorporating the water treatment classes, chemistry classes, and microbiology classes. An actual program dealing with water utility science and/or water systems technology focusing on water treatment, distribution, and wastewater processes can also be developed. The program can perhaps provide instruction for water and wastewater industry personnel interested in career advancement as well as to provide continuing education anyone certified in the field. In order to accomplish this, it may be necessary to have dedicated full-time faculty who teach water chemistry and wastewater microbiology.

Part 2B: (Required for CTE) External Data: Advisory Committee Recommendations & Labor Market Data
N/A
N/A

Part 2C: Review and comment on progress toward past Course Improvement Plans
List your past **Course Improvement Plans** (CIP) and progress toward meeting those plans. **WDTO115- SLO1: Students will demonstrate the ability to describe water supply systems, understand hydraulic principals, types of pumps, flowmeters and common materials used in water supply systems, SLO2: Students will demonstrate the ability to describe the disinfection process, calculate dosages, demand and free residual, flow rates and velocity, SLO3: Students will demonstrate the ability to recognize cross connections, recall safety practices used in waterworks operations and maintenance. understand related standards and regulations:** The SLO data for these SLOs show that almost all of the students have met and/or come close to exceeding the outcomes. This is expected since the goal of these classes is to prepare the students for the state examinations. **WDTO120- SLO1: Students will demonstrate the ability to recognize the various sources of water, their physical characteristics and potential for contamination. Describe conventional water treatment processes, SLO2: Students will demonstrate the ability to calculate water treatment math problems including chemical dosages for water treatment chemicals, flow rates, volumes, detention times, chemical solution percentages, horsepower, and energy costs, SLO3: Students will demonstrate the basic ability to identify, troubleshoot and solve treatment process problems that could compromise water, understand system operations and water related regulations:** The SLO data for these SLOs show that almost all of the students have met and/or come close to exceeding the outcomes. This is expected since the goal of these classes is to prepare the students for the state examinations.

Part 2D: Review and comment on progress towards past program review goals:
List your past program review goals and progress towards those goals. **Past program review was missing for Water Treatment and Distribution.**

Part 3: Based on Part 2 above, please list program/area goals for 2023-2024:								
Program /Area Goal #	**Goal Supports which:**				**ESP Goal Primarily Supported:**	**Goal** (Student-focused)	**Steps to be taken to achieve the goal?**	**Measure of Success** (How would you know you've achieved your goal?)
	ILO	**PLO**	**SLO**	**OO**				
#1: Begin the process of developing a local certificate program involving water utility science and/or water systems technology	ILO 4. Career and Specialized Knowledge				Goal 5: Align instructional programs to the skills identified by the labor market	Expand upon current offerings to better serve students and provide more career opportunities	Research what is needed to begin certificate program, research into the number of classes needed as well as determining if there are adequate faculty to teach any potential courses.	This will be determined by if/when a certificate is offered within the next year.
#2: Outreach and increasing community interest	ILO 3. Community/ Global Consciousness				Goal 4: Advance more students to college-level coursework- Develop and implement effective placement tools	Raise awareness regarding the benefits of water related jobs/education	Promotion of the current classes as well as brochures/flyers that highlight the need for jobs in this field.	Enrollment data from Fall 2023- Fall 2024

Part 4: Resource Requests that Support Program Goals (Based on the above analysis, please use the following space to document resource requests)

Type of Resource Request	Summary of Request	Which of your Program/area goals (Part 3) does this request support?	New or Repeat Request	Amount of Request, ($)	One-Time or Recurring Cost, ($)	Contact's Name
(NONE)						

***REQUIRED: After gathering the information above, fill out your RESOURCE REQUESTS to be shared with the Budget Committee:**
https://www.surveymonkey.com/r/2023PR_ResourceRequest

Part 5: Insert your Program Review Data here and any other supporting data. (See Part 2A above).
Required:
- Program Review tab
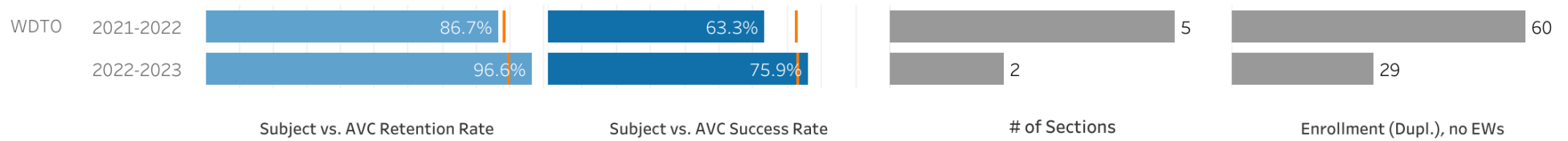- S&R by Demographic Groups tab

Optional:
- Other supporting data/information

Please Select **Subject** area (twice) and **Program Major(s)** to get your data -->

Retention, Success, Number of Sections, & Enrollment in WDTO (Total AVC rates are shown as | *hover over to see data*)

WDTO		Subject vs. AVC Retention Rate	Subject vs. AVC Success Rate	# of Sections	Enrollment (Dupl.), no EWs
	2021-2022	86.7%	63.3%	5	60
	2022-2023	96.6%	75.9%	2	29

Enrollment and Number of Sections by *Modality* in WDTO

	Instr. Method	2021-2022	2022-2023
Number of Sections	Online	0	
	Traditional	5	2
Enrollment	Online	11	
	Traditional	49	29

Enrollment and Number of Sections by *Location* in WDTO

	Location	2021-2022	2022-2023
Number of Sections	Lancaster	5	2
	Palmdale	0	
Enrollment	Lancaster	49	29
	Palmdale	11	

Number of Program Awards in None

FTEF by Contract Type, Part-time/Full-time Ratio, FTES, FTES/FTEF in WDTO

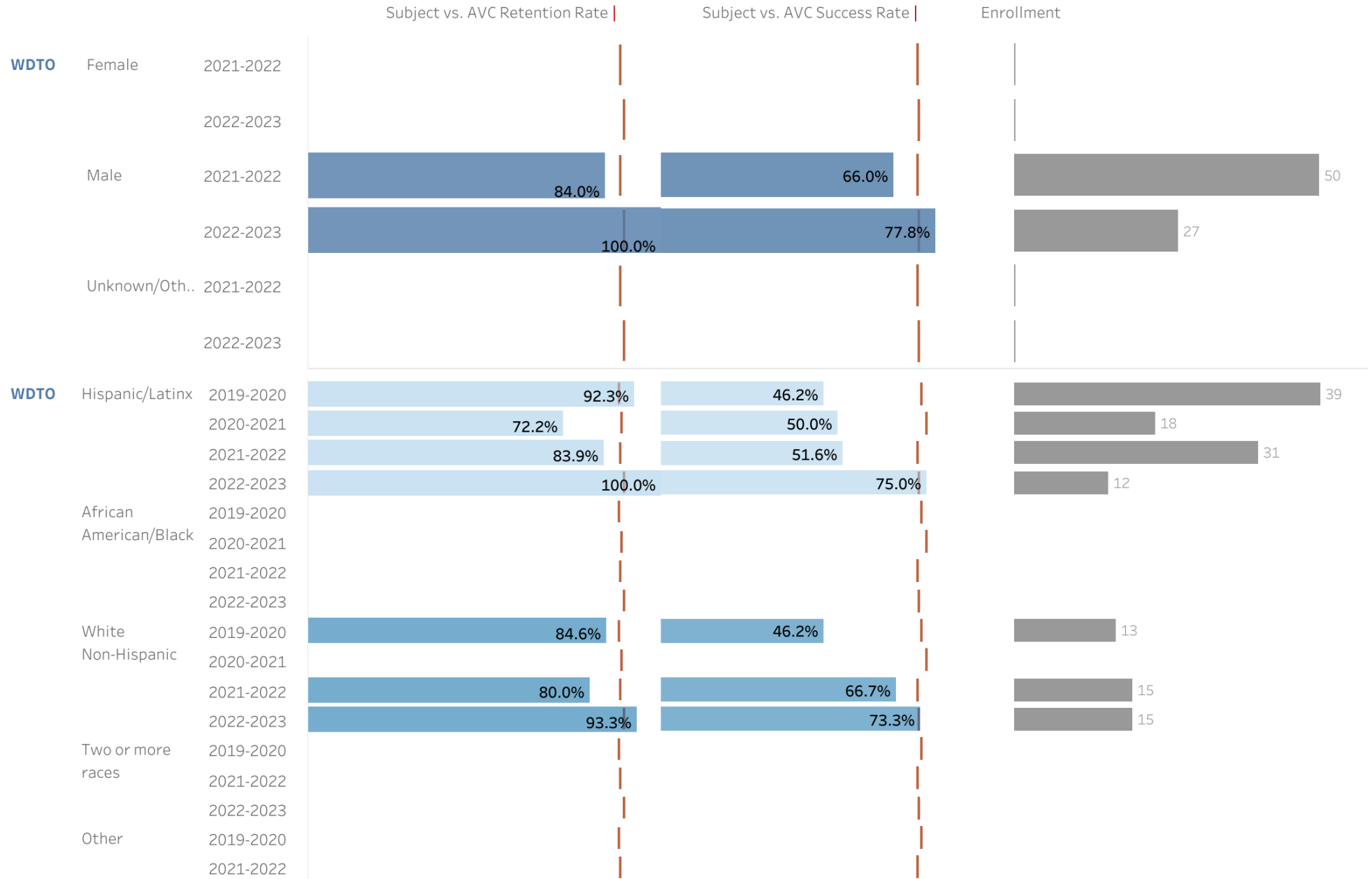|	Fall 2019	Fall 2020	Fall 2021	Fall 2022
PT (Adjunct) FTEF	0.4	0.4	0.4	0.4
TOTAL FTEF	0.4	0.4	0.4	0.4
FTES	3.8	2.2	2.6	3.0
FTES/FTEF Ratio	9.6	5.5	6.6	7.5
WSCH/FTEF Ratio	288.0	163.5	197.3	225.0
WSCH	115.2	65.4	78.9	

Click here
to see AVC's Program
awards dashboard

Subject-Level Retention Rate (RR), Success Rate (SR), and Enrollment by Sex & Race/Ethnicity as Compared to AVC's Rates (|)

If the Subject bars are below the vertical lines | , it indicates that equity gaps exist in SR or RR for those sub-groups as compared to overall SS or RR. Some questions to ask when looking at the data:
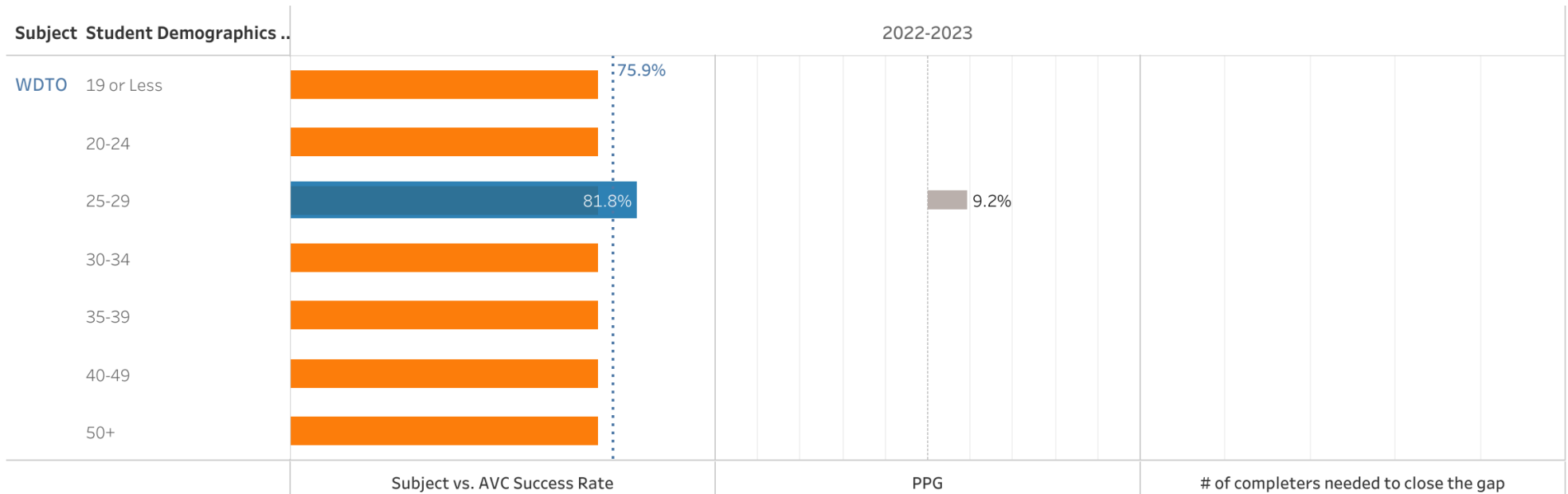*- What are the potential reasons for equity gaps? - What can my program implement to mitigate these gaps? (Consider such factors as curriculum design, teaching methods, campus climate, and support services.) - What resources/training are available/needed to support these efforts?*

			Subject vs. AVC Retention Rate		Subject vs. AVC Success Rate		Enrollment
WDTO	Female	2021-2022					
		2022-2023					
	Male	2021-2022	84.0%		66.0%		50
		2022-2023	100.0%		77.8%		27
	Unknown/Oth..	2021-2022					
		2022-2023					
WDTO	Hispanic/Latinx	2019-2020	92.3%		46.2%		39
		2020-2021	72.2%		50.0%		18
		2021-2022	83.9%		51.6%		31
		2022-2023	100.0%		75.0%		12
	African American/Black	2019-2020					
		2020-2021					
		2021-2022					
		2022-2023					
	White Non-Hispanic	2019-2020	84.6%		46.2%		13
		2020-2021					
		2021-2022	80.0%		66.7%		15
		2022-2023	93.3%		73.3%		15
	Two or more races	2019-2020					
		2021-2022					
		2022-2023					
	Other	2019-2020					
		2021-2022					

Academic Year Slider

Click to Include EWs

2022-2023 Disproportionate Impact (DI) as Percentage Point Gap (PPG)
Blue Bars show Success Rate (SR) within the sub-Groups vs. AVC Annual SR (orange bar) vs. WDTO Annual SR (dotted line)

Subject	Student Demographics ..	2022-2023		

| | | Subject vs. AVC Success Rate | PPG | # of completers needed to close the gap |

WDTO — 19 or Less — 75.9%
25-29 — 81.8% — 9.2%

In 2022-2023, WDTO's Success Rate was 75.9% vs. AVC's Annual rate of 72.6%

Overall Disproportionate Impact as percentage point gap was : 3.3%

In WDTO, 29 was the enrollment count (duplicated headcount) (only shows if n > 10)

If there is a Disproportionate impact (PPG is negative) , multiply the absolute value of PPG by the number of students and divide it by 100 to determine how many more successful completers would eliminate the gap.

*(For example, (29 * |3.3%|)=1. it means that 1 more successful course completers would help close the gap for this subject area)*

(Hover over each bar in the chart to see details about each sub-group)

Some possible questions to ask when looking at the DI data:

- What are the potential reasons for equity gaps?

- What can my program implement to mitigate these gaps?

- What resources are available to support these efforts?