Fall 2024 Program Review Report | Instructional Areas

Division/Area Name: Mathematics, Sciences & Engineering / Astronomy (ASTR)	**For Planning Years: 2025-2026**
Name of person leading this review: Mark McGovern	
Names of all participants in this review: 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 *Success & Retention* and *Program Award* tabs to inform your analysis)

- What are the success and retention rates 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 *Success & Retention* tab including S&R by Ethnicity and Gender data to inform your analysis)

- Which ethnic / gender student groups complete their courses at the highest rates?
- Which ethnic / gender 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 S*trengths 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 toward 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 April 2024.

For courses within the discipline, we have been able to maintain high success (> 80%) and retention (> 93%) rates which stay consistently above the overall college average. Regarding equity, retention rates by gender are relatively high (93% for women, 90% for men) which is well above the college average. Success rates show similar success rates (81% for women; 77% for men) which were also above the college average. The highest rates for retention and success for race/ethnicity are found among Hispanic/Latine (91% and 80%, respectively, this past year) and White Non-Hispanic (100% and 90%, respectively, this past year).

Each year the discipline offers 3 sections of online astronomy that can service up to 144 students.

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 & AB 1705, 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. The discipline will be working with the AP&P committee to develop a non-credit course that reviews mathematical concepts that occur in both the lecture and the lab.

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 eight 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

☒ N/A

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, Earth, Marine, and Space Sciences Teachers, Postsecondary (TOP code 1911.00). It is estimated that there are approximately 370 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** (CIPs) and progress toward meeting those plans.

Past Course Improvement Plans	Progress Made
ASTR 101, SLO 1 – Maintaining Satisfactory Performance. 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.	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 because of analyzing SLO data. 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. For this upcoming year, there will be a greater focus on the conceptual understanding of mathematical concepts. This work was started last year but more time is required to see if an improvement in performance is observed.	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 for the last couple of years. To maintain this satisfactory progress, it will be important to review current methodologies in instruction and lab procedures to ensure they are aligned with outcomes goals.	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. A student worker has been hired to operate the equipment for shows and to develop custom content. At the time of writing, several quotes have been procured to upgrade the planetarium software to Digistar 7 to utilize the latest suite of content available to be purchased.
#2 – Lab Equipment	Unfortunately, due to the focus on improving the quality of VSL materials, increasing the community outreach for the utilization of the VSL, and the upgrade to Digistar 7 there has been very little progress in obtaining additional equipment for laboratory equipment. However, the current equipment does suit the needs of the discipline at this time.
#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. This should occur in the next couple of years.
#4 - Enrollment	The number of online sections has been expanded to 3 per academic year. In addition to a yearly honors course for ASTR 101, the number of ASTR 101 and 101L sections seem to be sufficient to satisfy the enrollment needs of the discipline.

Part 3: Based on Part 2 above, please list program/area goals:

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 #6 Success: Boost success rates by prioritizing the student experience.	Upgrade current planetarium software to Digistar 7 to increase the library of VSL content to improve the quality of education for students.	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 – Maintain and upgrade laboratory equipment	ILO 2. Creative, Critical, and Analytical Thinking		ASTR 101 SLO #1		Goal #6 Success: Boost success rates by prioritizing the student experience.	Modernize current equipment and incorporate new equipment in lab activities to improve the quality of education for students.	New equipment will need to be acquired and introduced into current lab activities. Additionally, identify and purchase suitable replacement equipment for current lab activities.	The acquisition of newly purchased equipment and their successful integration into current lab activities. We should see an increase in the number of students achieving the targets for our SLOs in ASTR 101L.
#3 – Continue work on the creation of a laboratory manual	ILO 1. Communication		ASTR 101 SLO #1, 2		Goal #6 Success: Boost success rates by prioritizing the student experience.	Finish the work on the creation of a laboratory manual to provide students with a cohesive laboratory experience.	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 the faculty has deemed it suitable for reproduction and distribution.

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	Purchase new licenses or renew licenses for VSL software	#1	Repeat	$200,000	Recurring	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.	#2, 3	Repeat	$10,000	Recurring	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	#1	Repeat	$4,000	Recurring	Jedidiah Lobos (Dean), Alexandra Schroer (Chair), Mark McGovern (Faculty)

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

Required:

- Success & Retention tab
- Program Awards tab

Optional:

- Other supporting data/information

Success and Retention

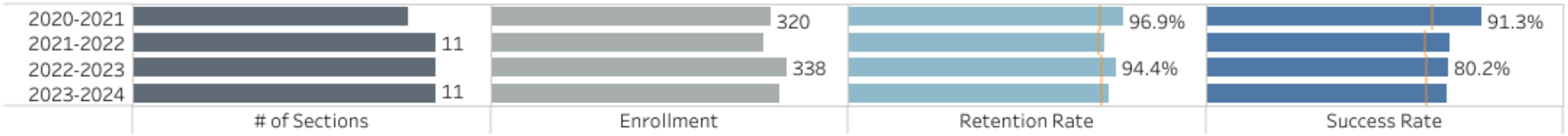
Select Academic Year: Multiple values

Select Subject: ASTR

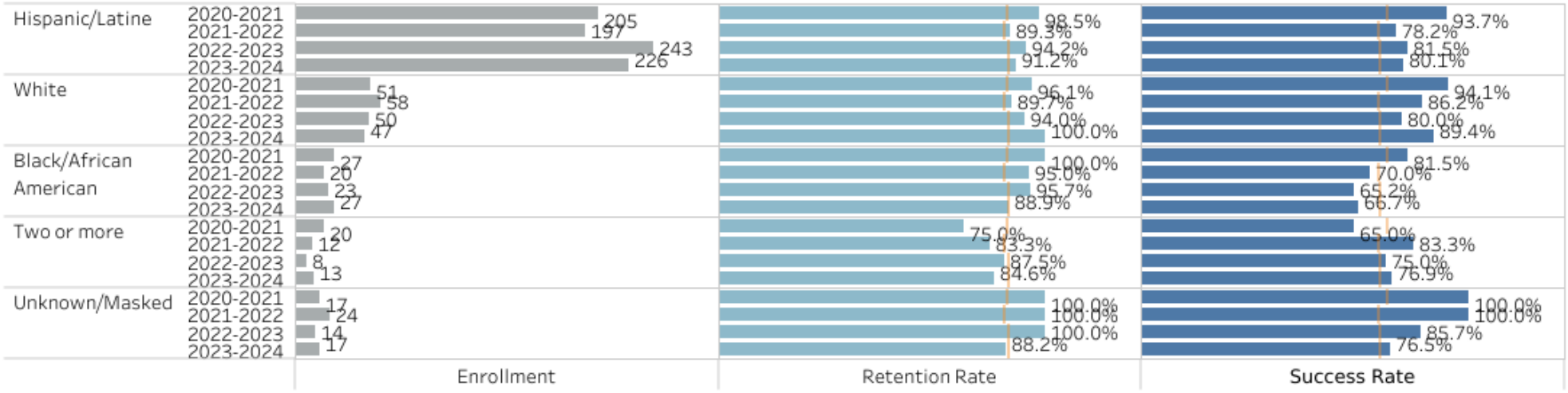
< Select subject here

AVC Retention and Success shown in vertical |

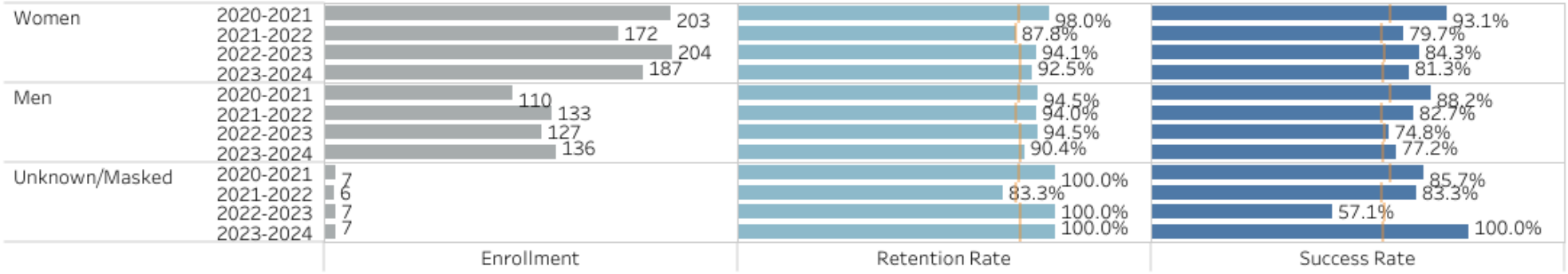
Overall Enrollments, # of Sections, Retention and Success by Year for ASTR



Enrollments, Retention & Success for ASTR by Ethnicity



Enrollment, Retention and Success for ASTR by Gender



Program Awards

Select Academic Year: Multiple values

Select Ethnicity: All

Gender All

(Use these filters add years & disaggregate by ethnicity and gender for both of the visualizations below)

Institutional Awards

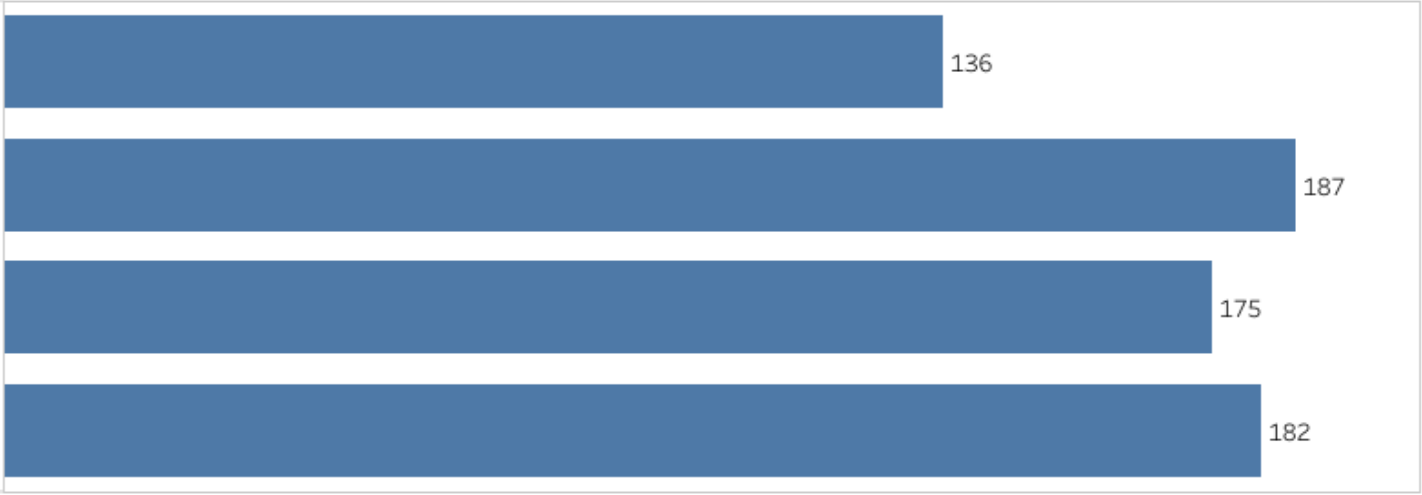
Award Type	2020-2021	2021-2022	2022-2023	2023-2024
AA-T/AS-T	790	860	734	640
AA/AS	1184	1366	1172	1292
Certificate	1223	1426	1115	1108
AVC Local Certificate	159	189	210	194
Bachelor's	16	13	16	21
Non-Credit	82	58	38	64
Grand Total	**3454**	**3912**	**3285**	**3319**

Select Program Majors: LAS: Math and Sciences

< Select Program Major for the chart below

Subject Awards for LAS: Math and Sciences

Award Type	Degree Desc	Academic ..
AA/AS	LAS: Math and Sciences	2020-2021
		2021-2022
		2022-2023
		2023-2024



Division/Area Name: Mathematics, Sciences & Engineering / Biological Sciences	For Planning Years: 2025-2026
Name of person leading this review: Bassam Salameh & Zia Nisani	
Names of all participants in this review: Osvaldo Larios-Perez, Lena Coleman, Lauren Conroy, Joseph Esdin, Joshua Shipp, Patricia Palavecino, Jedidiah Lobos	

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 5th largest major on campus and in the 2022-2023 cycle we had 18(AS-BIOLOGY), 29 (AS-T Biology) & 182 (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. In 2023-2024, the biology program served 6,392 students while offering 172 distinct counts of CRNs. Finally, the program is spearheading the expansion of undergraduate research (UR) at AVC with many faculty being active in mentoring students conducting UR. This expansion of UR is giving our students, especially the ones from underrepresented and marginalized groups, opportunities not typically available at many community colleges, which is in concert with our institution's mission.

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:

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Equity (Use the *Success & Retention* tab including S&R by Ethnicity and Gender data to inform your analysis)

- Which ethnic / gender student groups complete their courses at the highest rates?
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Strengths and Accomplishments: *(Include your data analysis of success, retention, enrollment, completion rates OR other relevant metrics in your response.)*

(1) Most of the labs in majors' (Biol 110 & 120) and non-majors' (Biol 101) courses are based on inquiry-based education. These practices help students connect science to the real world and encourages their curiosity and critical thinking skills. This is reflected in the SLO numbers for these courses.

(2) An increasing number of faculty are actively engaged in scientific research and are mentoring students conducting undergraduate research. This research is either embedded in the curriculum or is done independently. This has resulted in students presenting at conferences and publishing papers in peer-reviewed journals.

(3) The number of sections offered has steadily increased since the decline due to the pandemic and is holding steady around 172 sections.

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

Opportunities:
(1) Historically the biology program has had a lower success rate than the set district goal. However, since the last two program review cycles, the success rate has increased from 66.1% in 2021-2022, to 69.5% in 2023-2024. This is promising and we hope to work on increasing our success rate. For example, we plan on increasing the number of embedded tutors in labs and offering more "boot-camps" of basic skills (Reading and Math) during the semester. By doing so, our students will be better prepared to tackle the rigors of biology courses. It must be noted that in the Hispanic/Latinx and Black/African American students there has been a steady increase in success rate. Since 2021-2022 the success rate on these groups has increased to 68.2% (from 64%) and 60.4% (from 55.6%) respectively. It must be noted that the program's success rate is close to the overall campus success rate for the Black/African American students (61.3%). However, our Hispanic/Latinx student success rate is 5% lower than the campus. The success rate has also increased amongst male and female students to 71.8% (from 67.2%) and 68.6% (from 65.5%) respectively.

(2) Overall, the grades in biology have normal distribution and this suggested that grade inflation is not an issue. However, the major area of concern is amongst Black/African American Students, the percentage of students completing the class with A, B, C, & P is 60%. This number is the lowest amongst all the other races/ethnicities. Hispanic/Latinx students had the second lowest percentage (about 68%) in these grade categories. Finally, the grade distribution between the biological genders was not statistically significant.

(3) Currently, an AS in Human Biology and Wellness is going through the curriculum process. This degree is designed specifically for allied health majors who are preparing to apply for the nursing, radiologic technology, and respiratory therapy programs to allow those students to earn a degree in the process of preparing for these programs.

(4) Strong Workforce funds have been allocated to renovate the current biology lab in order to accommodate offering General Microbiology at the Palmdale Center. The same funds will be used to build a new lab to allow for the offering of Anatomy and Physiology at the Palmdale Center as well. Expanding our course offerings of these specific classes may lead to an increase in the number of students prepared to apply for the allied health programs.

Challenges:
Despite the closure of the Horticultural Program in 2021, which had Botany as a required course, we have continued to offer the class with one section in spring and two in fall. Over the past five years and despite the efforts, spring enrollment has remained low, averaging just 14.2 students according to eLumen data and grade reports. Unfortunately, the Spring section usually faces the risk of last-minute cancellation due to this low enrollment. This issue was raised with the Division Dean, suggesting that we consider removing the Spring offering. In contrast, Fall sections have seen more stable enrollment (with an exception in 2021), although without significant improvement, and is showing a slow decrease in enrollment.

This Fall (2024), the enrollment of students in several Biology classes (General Biology and Introduction to Botany, specifically) were drastically impacted by fraudulent student enrollment. The institution is taking steps to remedy future attempts at fraudulent enrollments.

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

We increased 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) and other research-based activities. Both courses have state of the art and research quality equipment and tools. This allows us to give our students the opportunities to develop their lab and critical thinking skills. The new lab manual for Biology 10 labs was debuted in Spring 2023. This manual, which was created by AVC faculty, has much more inquiry-based material than the previous iteration. Since General Biology (Biol 101) is the feeder course of many courses in the allied health fields, it is important for the students to have a greater understanding of the material presented in Biol 101. 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. To take steps in developing and encouraging more UR in biology, two new courses ("Research Practicum" & "Work Experience") were developed and are working their way in AP&P. It is hoped we have these in the catalog by Fall 2025.

BIOL 101

- In Biology 101L, our lab manual will continue to evolve in conjunction with advancements in scientific research and pedagogy. We will modify any activities which seem unsatisfying to students and/or instructors.
- In Biology 101, we improved our pass rate from about 65% to 75% from Fall 2023 to Spring 2024 but would like to still stive for improvement or at least a long-term stability of higher pass rates. While about 55% meet the SLOs in Spring of 2024, only 18% meet and exceeded. Updating the textbook and encouraging lecture professors to sync their course topics to lab topics are desired with the hope of increasing student success.

BIOL 110

- Bio 110 has made considerable updates to our worn-out equipment by implementing inquiry-based lab exercises and the introduction to CURE (Course Based Undergraduate Research). Students' research interest has been growing for the study of mutated yeast and comparing their cell division rates to the wild-type *Schizosaccharomyces* pombe. Due to students' involvement with CURE, we have replaced our spectrophotometers with six new ones and added brand new micropipettes (P1000, P100, P5, and P20 (pending on arrival) for which all students are assigned their own.
- With the new spectrophotometers, we will be analyzing several plants instead of just one plant for our photosynthetic pigments lab. We will also analyze the absorbances in other lab exercises including the analysis of anthocyanidin pigment in our Anthocyanidin Pigment pH lab exercise.

BIOL 103

- Since the fall of 2019, significant improvements have been made to the Introduction to Botany course (Bio103) to establish it as a valid science option to General Biology (Bio101) for students fulfilling their general education requirements. This course could appeal particularly to those with an interest in plants and may serve as an excellent elective choice as well.
- Notable updates included the addition of an Honors Option, field trips, a blended section, and, starting in fall 2024, a complimentary customized laboratory manual created by Dr. Palavecino to enhance affordability for students. As a coordinator, I put time and effort into making this course visible to potential students.

BIOL 104

- Biology 104 (Environmental Biology) is a lecture-only biology course that combines biological concepts with environmental sciences. It is offered both in-person and online asynchronously. In a typical semester, around 45 students take the course in person and a further 80-90 take it online. As it does not carry a lab, it is easier to accommodate online education with this course than typical biology classes, where lab work does not translate to online-only teaching. Most students seem to appreciate having an online asynchronous option, to accommodate busy schedules including working during the week and other factors. As with online teaching in general, instructors for Biology 104 have noticed a significant increase in students using AI software to cheat on assignments, essays, presentations, quizzes, and exams, so it is recommended that online instructors have students take exams in person, at least. It is also important for online instructors to be vigilant for AI misuse and to communicate extensively with students regarding expectations for academic honesty in the classroom. A free e-book (open textbook) option is available for environmental biology, written by Fisher, and it is recommended that instructors use this textbook, if possible, to assist students who have financial challenges.

BIOL 201

- We have ordered more bones and models in addition to other teaching tool. We have added more anatomical models and bone models to make these items more accessible for individual student learning along with that of enhancing support for the peer-to-peer collaborative learning model in the lab.

- We also got an approval to purchase a cadaver to be used for teaching in our anatomy course. We plan to gradually phase out the use of cats as the mammalian dissection item of choice and use more human cadavers.
- We will be expanding our Honors Program. Honors students will take the lead in the dissection of an additional cadaver (recently approved) with the direct supervision of Anatomy faculty.
- We will continue to explore ways to use digital content and cadavers within the Biology 201 curriculum.

BIOL 202

- We have ordered a lot of lab equipment as well as new computers. We have incorporated new computers and software within the course curriculum. We are committed to identifying ways to improve student learning in Physiology.
- We are in the process of updating and standardizing the laboratory curriculum with this new equipment. We have also maintained and emphasized student safety in the lab and reduced the use of human specimens (mainly urine and blood).

BIOL 204

- A detailed instructional PowerPoint on the use and care of the microscope was made available to all BIOL 204 faculty as well as others. This will help all instructors standardize the competence of our students using this instrument. No requests for equipment or new material have been made.

BIOL 304

- Continue to develop interesting ways to keep the students' attention and interest in this subject that can be intimidating to many outside the science or medical field.
- Will be developing the online version of this course for the Bachelors' degree in Respiratory Care next year.

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

☒ N/A

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** (CIPs) and progress toward meeting those plans.

BIOL 101 Lab

We have one student learning outcome (SLO) for Biology 101 Lab:

Apply the scientific method to formulate and test a hypothesis. Students will be able to conduct an experiment, collect data, analyze results, and prepare scientific reports.

From Fall 2023 through Summer 2024, 937 students were assessed. The SLO was met (70% minimum criterion). In total, 77.26% of students met or exceeded expectations (31.48% met and exceeded, 45.78% met).

For comparison, during the 2022-2023 academic year, the SLO was also met, with 72.19% of students meeting or exceeding expectations.

It is encouraging that we continue to meet the SLO for this course, with slight improvement this year compared to last. Validation by this measure demonstrates that our inquiry-based lab manual is effective.

BIOL 101 Lecture

We have two SLOs for Biology 101 lecture: Evaluate the principles of evolution and organize living things in taxonomic groups to study the diversity of life. (1) *Recognize the relationships among organisms and define life and describe the basic unit of life, the cell.* (2)*Correlate cellular organelles with their functions; understand biological processes that maintain life.*

From Fall 2023 through Summer 2024, the SLOs were close to, but did not meet the minimum target of 70%, at 67% meets, or meets and exceeds (n = 1860).

Looking at a comparison of Fall 2023 and Spring 2024, however, there was improvement toward the target. Fall 2023 was 66% meets/meets and exceeds and Spring 2024 was 73% meets/meets and exceeds.

While improvement is encouraging, we hope to maintain a trend of meeting the 70% target with more consistency. Putting resources and effort into updating the course materials may help to improve progress towards these targets.

BIOL 103

All SLOs in this course were met.

BIOL 104

Biology 104 carries two SLOs that were met or exceeded in the previous Course Improvement Plan for 2022-2023. No additional resources were required at that time. Based on current data from Fall 2023-Summer 2024, students continue to meet or exceed the SLO goals. Over these three semesters, an average of 76.7% of students met or exceeded the first SLO goal (range 73.98-80.49%). The second goal was met by 79.35% of students (range 75.61-82.11%). Overall, both SLOs were met on average by 78.02% of students. Based on this data, this course is working well for students and preparing them for understanding the concepts evaluated by the two SLOs, and significant changes are not required.

BIOL 110

Of the three Bio 110 SLOs, we exceeded the expected/achievement performance/target for our SLO #1, close to achieving SLO #3, and felt below for 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 an 80.43%. This was an increase of 10.68% when compared to our 69.75% obtained in 2023.

As for **SLO #3**, "demonstrate an ability to formulate meaningful research question in molecular-cell biology, designed controlled scientific experiments to investigate those questions, and write up the results in publishable form" we came close to our 75% expected performance by achieving a 74.60%. This was a 10% decrease when compared to our 84.62% obtained in 2023. We plan to continue our students write and maintain a scientific lab notebook throughout the course while submitting more than the usual 2 lab reports. The lab notebook/report serve to meet our SLO #3 by assessing students written work while presenting their findings in a coherent and constructive discussion/conclusion.

Our **SLO #2**, "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", was 39.34% which felt below our 75% expected performance. Though SLO #2 continues to be the lowest scoring of the three SLOs, this year it increased from 16.24% in 2023.

As stated in last year's program review, our SLO #2 is somewhat outdated. I have begun the process to replace the language to reflect a more modern analysis; "Demonstrate the ability to identify scientific variable, analyze experimental results, and interpret graphical data obtained from molecular biology experimentation". We will assess our new SLO #2 through the Transformation of Chemically Competent *E. coli* lab exercise, the use of centrifugation to separate plant/bacterial components, and the analysis of DNA through agarose gel electrophoresis. Lab #3 The Cell and Lab #11 Agarose Gel Electrophoresis will be used to assess SLO #2 in the future program review.

BIOL 120

Increase emphasis on evolutionary thinking and scientific process.

SLO1 & SLO2: Both SLOs 1 & 2 targets as a whole were met (SLO1: 78.7% met or exceeded & SLO2 70.6% met or exceeded). The biggest reason SLO1 is exceeds 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 trees but use those skills in lab (and lecture), especially when studying Fungi, Plants, and animals. As such, students apply the skills they learn to real work biological questions, such as how these two species are related. SLO2 highlights the importance of scientific thinking and scientific method. All BIOL 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. In some sections the research projects are open-ended and utilize Course based Undergraduate Research (CURE), 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. Some of the projects have led students to present their research at scientific conferences designed for undergrads. If this trend for both SLO's continues, we might consider raising the achievement target to 75%.

BIOL 204

All SLOs for this course were met or exceeded their cutoff marks:

1- Describe the characteristics of bacteria, viruses, protozoa, fungi, and parasitic worms and their interactions with the host organism, and how they cause diseases. Understand their role in food production and spoilage, water contamination, and sewage treatment. SLO Met or exceeded.
2- Using the laboratory techniques, skills, and research, students will independently investigate and identify unknown bacteria, and prepare a scientific report, demonstrating information competence. SLO Met or Exceeded

Based on the data above, no change is deemed necessary pending the next cycle.

BIOL 304

All SLOs for this course were met but few exceeded their cutoff marks:

1- Define and describe emerging and reemerging infectious diseases, epidemiology, and classification of selected infectious agents. SLO met but not exceeded.
2- Demonstrate an understanding of the biological, ecological, cultural, behavioral, and historical factors that affect the occurrence of these diseases and infections. SLO met but not exceeded.
3- Demonstrate and understanding of the role of Public Health to control and prevent these infections through surveillance, contact tracing, vaccination, and behavioral modifications. SLO met but not exceeded.

We Plan to stay the course for a few more cycles with any adjustments to the changes made above.

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.	Many of our biology courses, Biol 10L, 103, 110, 120, and 204 have inquiry-based activities ranging from case-studies to research projects that increases the students' understanding of the subject area and scientific method skills.
Goal #2: Improvement of student learning outcomes.	As mentioned in Part 2A, the success rate increased 3.4% in 2023-2024 to 69.4% and the success rate is increasing across all ethnic groups. However, we need to work on way to increase success rates among the Black/African American and Hispanic/Latinx students.
Goal #3 Develop an undergraduate research (UR) program.	Thanks to the Title V (Data Science) grant, we have significantly increased the number of faculty and students conducting UR. In 2023, we took a total of 23 students (mentored by 4 faculty) to two conferences. On November 23rd, 2024, we will be taking 33 students mentored by (7 faculty) to the Southern California Conferences for Undergraduate Research. We currently have a small lab dedicated to UR and there are many other faculty doing prep work to start working with students.

Part 3: Based on Part 2 above, please list program/area goals:

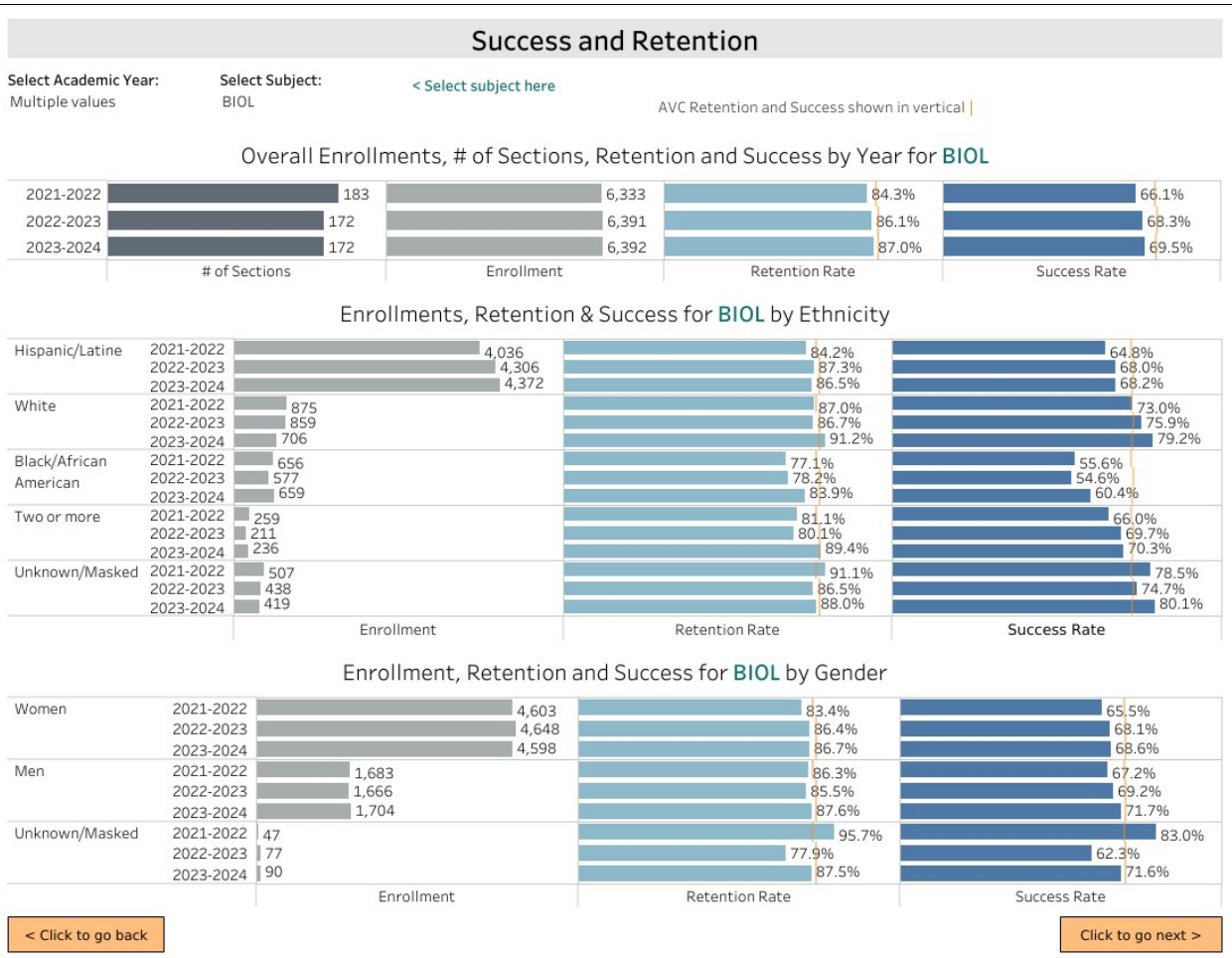
Program /Area Goal #	Goal Supports which:				ESP Goal Primarily Supported:	Goal (Student-focused)	Steps to be taken to achieve the goal?	Measure of Success (How would you know you've achieved your goal?)
	ILO	PLO	SLO	OO				
#1. Reform instructional	ILO 2. Creative, Critical, and	BIOL PLOs 1 & 5	Biol 120	N/A	Goal #6 Success: Boost success rates by prioritizing the student experience.	Increase the number of inquiry-based learning courses to engage	Having faculty workshops on developing hands-on lab	(1) Conduct student survey's in labs that have inquiry-based activities. There are

methodology to include Inquiry-based learning.	Analytical Thinking		SLOs 1 & 2 Biol 110 SLOs 2&3			students with the subject matter and enhance their learning.	activities and other high impact practices.	proven instruments out there that can be utilized. (2) For courses that have built-in UR, we will use URSSA (Undergraduate Research Student Self-Assessment). URSSA is an online survey instrument for use in evaluating student outcomes of undergraduate research experiences in the sciences.
#2. Increase enrollment by offering more course	ILO 2. Creative, Critical, and Analytical Thinking	N/A	N/A	N/A	Goal #5 Education: Expansion of offerings and effective course scheduling.	To have courses offered during the morning, afternoon, and night, while developing pathways to accommodate different students.	(1) Increase course offering across different modalities (when permitted) and times. (2) Develop pathways for both traditional and non-traditional students. For example, a pathway for full-time students and pathway for part-time student.	Doing a semester-by-semester comparison of different courses offered in the program.
#3. Enhance and grow the 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 #4 Vision: Being more future-thinking, agile, innovative, and proactive.	Increasing faculty participation in mentoring student research.	(1) Conduct workshops (through FPD) to train and inform faculty on how to develop and conduct UR. (2) Develop a Summer UR Fellowship (SURE) were we pair students with faculty to conduct research projects during summer. This program will be specific for students that are from marginalized and/or underrepresented groups.	Tracking the number of faculty and students engaged in UR. Also, using URSSA to measure students' gains.

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
Supplies	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. Due to recent changes to hazmat rules for preserved specimens, we cannot use items stored in formalin or formaldehyde. Therefore, we need to order pre-dissected specimens (Biosmount Specimens) for students to study, and limit dissections to few species that don't fall under the regulation.	#1	New	$5000	One-time	Zia Nisani
Physical/Facilities	Dedicated space to house Undergraduate Research activities.	#3	New	TBD (External Grant Money)	One-time	Zia Nisani
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.	

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


Success and Retention
Select Academic Year:
Multiple values
Select Subject:
BIOL
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AVC Retention and Success shown in vertical |
Overall Enrollments, # of Sections, Retention and Success by Year for BIOL
2021-2022 183 6,333 84.3% 66.1%
2022-2023 172 6,391 86.1% 68.3%
2023-2024 172 6,392 87.0% 69.5%
# of Sections
Enrollment
Retention Rate
Success Rate
Enrollments, Retention & Success for BIOL by Ethnicity
Hispanic/Latine 2021-2022 4,036 84.2% 64.8%
2022-2023 4,306 87.3% 68.0%
2023-2024 4,372 86.5% 68.2%
White 2021-2022 875 87.0% 73.0%
2022-2023 859 86.7% 75.9%
2023-2024 706 91.2% 79.2%
Black/African American 2021-2022 656 77.1% 55.6%
2022-2023 577 78.2% 54.6%
2023-2024 659 83.9% 60.4%
Two or more 2021-2022 259 81.1% 66.0%
2022-2023 211 80.1% 69.7%
2023-2024 236 89.4% 70.3%
Unknown/Masked 2021-2022 507 91.1% 78.5%
2022-2023 438 86.5% 74.7%
2023-2024 419 88.0% 80.1%
Enrollment
Retention Rate
Success Rate
Enrollment, Retention and Success for BIOL by Gender
Women 2021-2022 4,603 83.4% 65.5%
2022-2023 4,648 86.4% 68.1%
2023-2024 4,598 86.7% 68.6%
Men 2021-2022 1,683 86.3% 67.2%
2022-2023 1,666 85.5% 69.2%
2023-2024 1,704 87.6% 71.7%
Unknown/Masked 2021-2022 47 95.7% 83.0%
2022-2023 77 77.9% 62.3%
2023-2024 90 87.5% 71.6%
Enrollment
Retention Rate
Success Rate
< Click to go back
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Program Awards

Select Academic Year: Multiple values

Select Ethnicity: All

Gender All

(Use these filters add years & disaggregate by ethnicity and gender for both of the visualizations below)

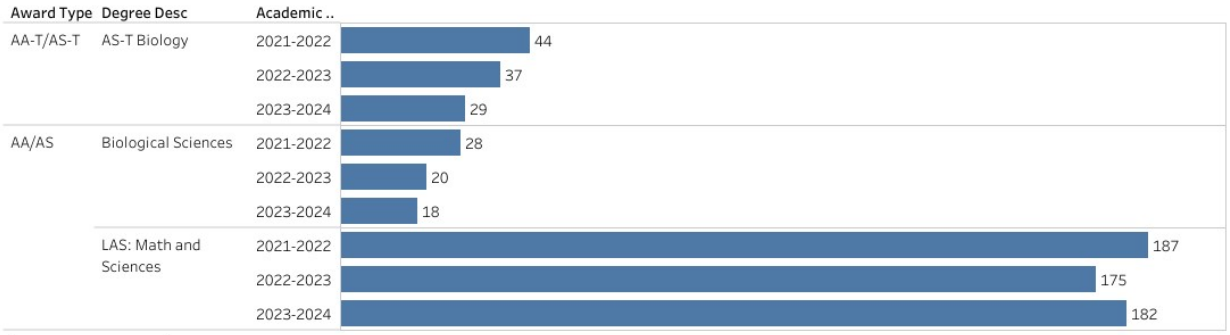
Institutional Awards

Award Type	2021-2022	2022-2023	2023-2024
AA-T/AS-T	860	734	640
AA/AS	1366	1172	1292
Certificate	1426	1115	1108
AVC Local Certificate	189	210	194
Bachelor's	13	16	21
Non-Credit	58	38	64
Grand Total	**3912**	**3285**	**3319**

Select Program Majors: Multiple values

< Select Program Major for the chart below

Subject Awards for AS-T Biology, Biological Sciences, LAS: Math and Sciences



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Grade Distribution

Academic Year: 2023-2024

Subject: BIOL

Overall Grade Distribution for BIOL

Grades Distribution for BIOL by Ethnicity

Ethnicity	A,B,C, or P	D,F,NP	W	I,RD,IP	EW
Black/African American	60.2%	23.4%	16.1%	0.3%	
Hispanic/Latine	67.6%	18.2%	13.2%	0.8%	0.2%
Two or more	70.3%	19.1%	10.6%		
Unknown/Masked	79.7%	7.9%	11.9%	0.5%	
White	78.9%	11.9%	8.8%	0.4%	

Grade Distribution for BIOL by Gender

Sex	A,B,C, or P	D,F,NP	W	I,RD,IP	EW
Men	71.3%	15.9%	12.2%	0.5%	0.1%
Women	68.1%	18.0%	13.1%	0.7%	0.1%
Unknown/Masked	68.5%	15.2%	12.0%	2.2%	2.2%

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FTEF

Select subject:
BIOL

FTEF

	Fall 2020	Fall 2021	Fall 2022	Fall 2023
PT (Adjunct) FTEF	6.27	3.93	3.53	5.43
FT (Full-time) FTEF	14.07	14.47	14.60	14.00
FT (Overload) FTEF	2.47	4.33	2.80	3.13
Grand Total	22.80	22.73	20.93	22.57

PT/FT FTEF Ratio

	Fall 2020	Fall 2021	Fall 2022	Fall 2023
PT/FT FTEF Ratio	1	1	1	1

Full-Time Equivalent Faculty (FTEF) – a faculty member's actual workload standardized against the teaching load (15 LHE). FTEF does not represent an actual number of faculty members; it is a conceptual measure of the workload. FTEF = Contract Workload/15 (Contract teaching load, LHE) (E.g., a 3-Unit Class = 0.2 FTEF)

FTES, FTES/FTEF, and WSCH are unavailable in this dashboard. If this information is needed, please request access to Precision Campus via research@avc.edu.

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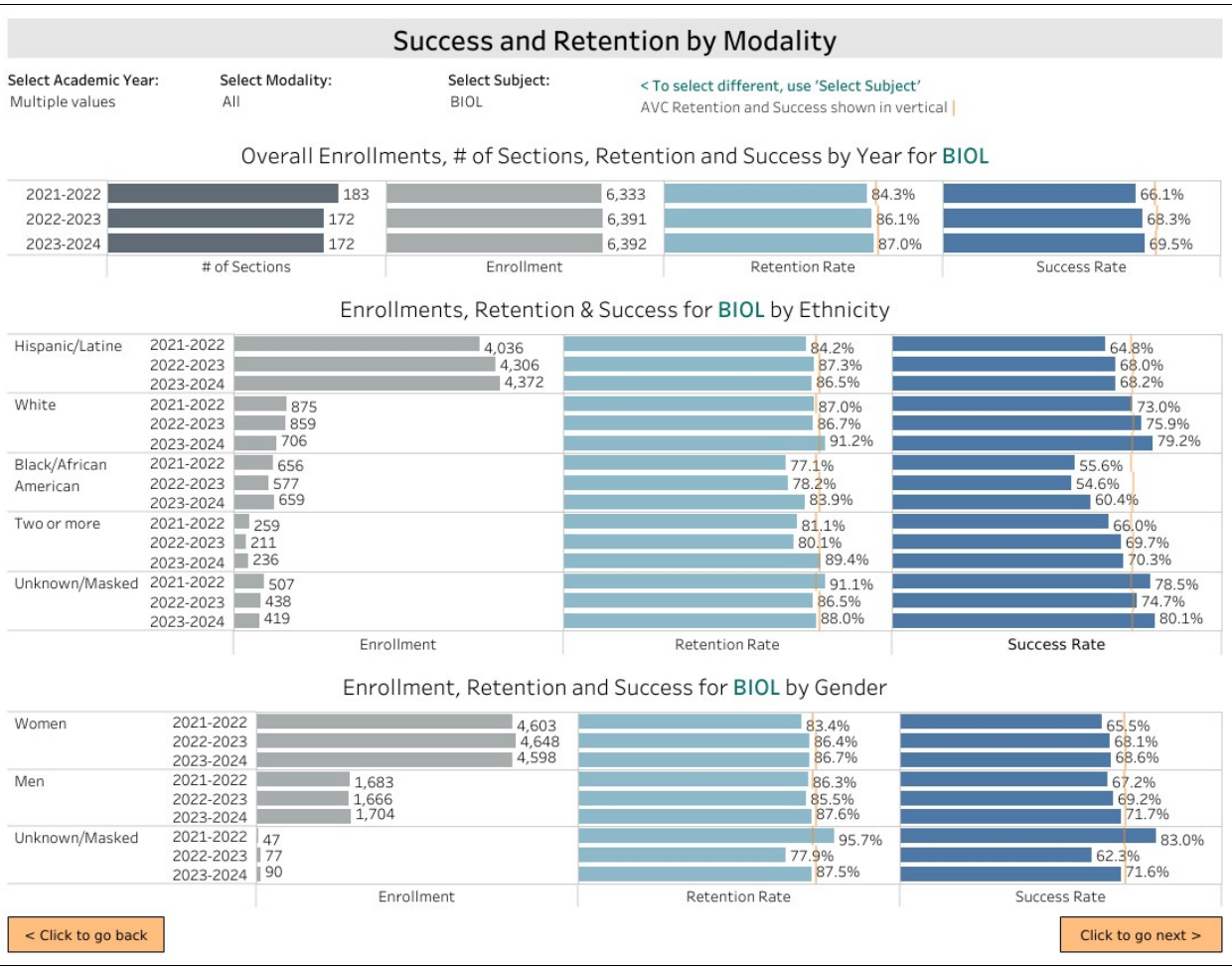
Success and Retention by Modality
Select Academic Year:
Multiple values
Select Modality:
All
Select Subject:
BIOL
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Retention Rate
Success Rate
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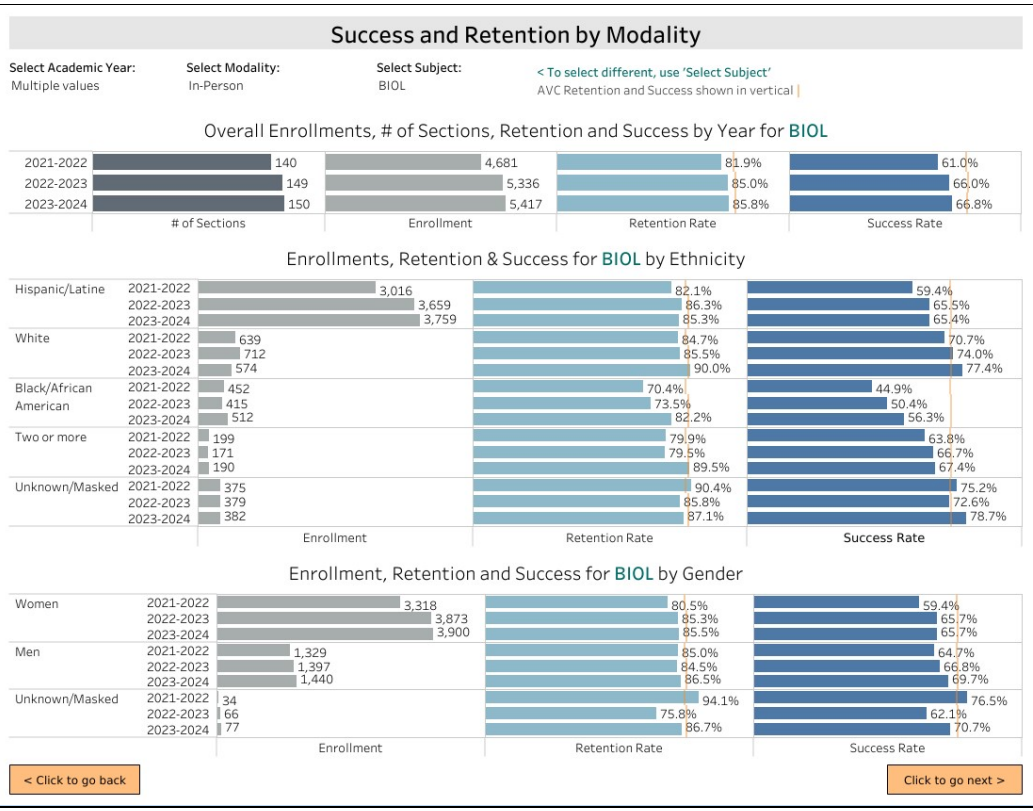
Success and Retention by Modality
Select Academic Year:
Multiple values
Select Modality:
In-Person
Select Subject:
BIOL
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AVC Retention and Success shown in vertical
Overall Enrollments, # of Sections, Retention and Success by Year for BIOL
2021-2022 140 4,681 81.9% 61.0%
2022-2023 149 5,336 85.0% 66.0%
2023-2024 150 5,417 85.8% 66.8%
# of Sections
Enrollment
Retention Rate
Success Rate
Enrollments, Retention & Success for BIOL by Ethnicity
Hispanic/Latine 2021-2022 3,016 82.1% 59.4%
2022-2023 3,659 86.3% 65.5%
2023-2024 3,759 85.3% 65.4%
White 2021-2022 639 84.7% 70.7%
2022-2023 712 85.5% 74.0%
2023-2024 574 90.0% 77.4%
Black/African American 2021-2022 452 70.4% 44.9%
2022-2023 415 73.5% 50.4%
2023-2024 512 82.2% 56.3%
Two or more 2021-2022 199 79.9% 63.8%
2022-2023 171 79.5% 66.7%
2023-2024 190 89.5% 67.4%
Unknown/Masked 2021-2022 375 90.4% 75.2%
2022-2023 379 85.8% 72.6%
2023-2024 382 87.1% 78.7%
Enrollment
Retention Rate
Success Rate
Enrollment, Retention and Success for BIOL by Gender
Women 2021-2022 3,318 80.5% 59.4%
2022-2023 3,873 85.3% 65.7%
2023-2024 3,900 85.5% 65.7%
Men 2021-2022 1,329 85.0% 64.7%
2022-2023 1,397 84.5% 66.8%
2023-2024 1,440 86.5% 69.7%
Unknown/Masked 2021-2022 34 94.1% 76.5%
2022-2023 66 75.8% 62.1%
2023-2024 77 86.7% 70.7%
Enrollment
Retention Rate
Success Rate
< Click to go back
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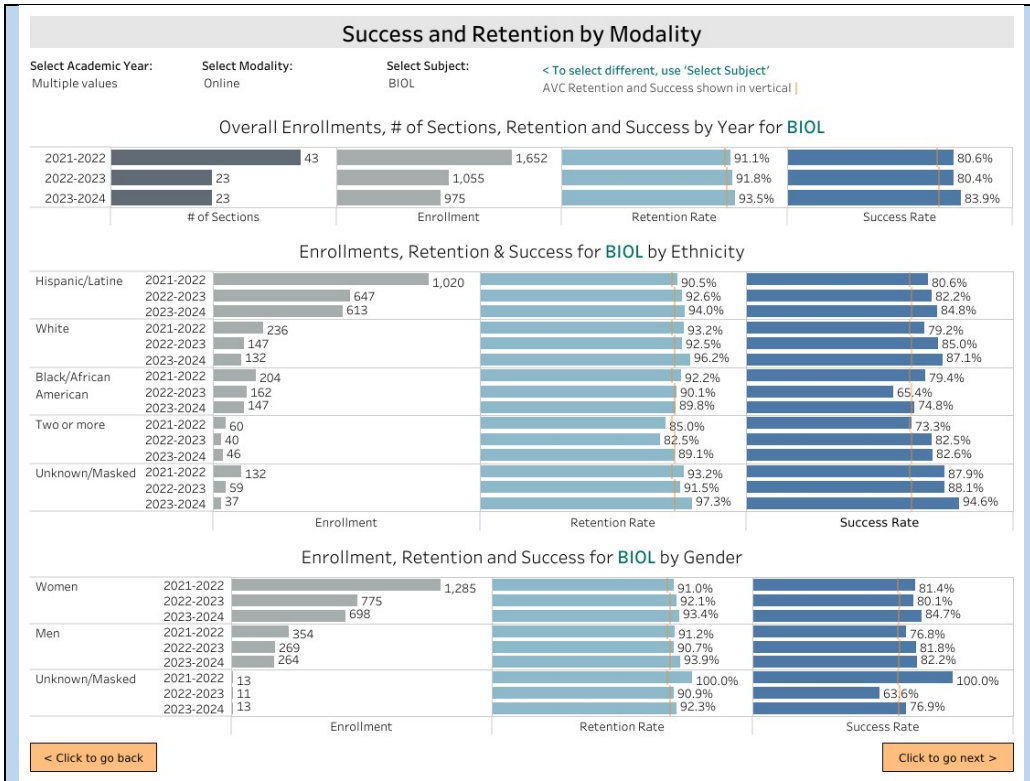
Success and Retention by Modality
Select Academic Year:
Multiple values
Select Modality:
Online
Select Subject:
BIOL
< To select different, use 'Select Subject'
AVC Retention and Success shown in vertical |
Overall Enrollments, # of Sections, Retention and Success by Year for BIOL
2021-2022 43 1,652 91.1% 80.6%
2022-2023 23 1,055 91.8% 80.4%
2023-2024 23 975 93.5% 83.9%
# of Sections
Enrollment
Retention Rate
Success Rate
Enrollments, Retention & Success for BIOL by Ethnicity
Hispanic/Latine 2021-2022 1,020 90.5% 80.6%
2022-2023 647 92.6% 82.2%
2023-2024 613 94.0% 84.8%
White 2021-2022 236 93.2% 79.2%
2022-2023 147 92.5% 85.0%
2023-2024 132 96.2% 87.1%
Black/African American 2021-2022 204 92.2% 79.4%
2022-2023 162 90.1% 65.4%
2023-2024 147 89.8% 74.8%
Two or more 2021-2022 60 85.0% 73.3%
2022-2023 40 82.5% 82.5%
2023-2024 46 89.1% 82.6%
Unknown/Masked 2021-2022 132 93.2% 87.9%
2022-2023 59 91.5% 88.1%
2023-2024 37 97.3% 94.6%
Enrollment
Retention Rate
Success Rate
Enrollment, Retention and Success for BIOL by Gender
Women 2021-2022 1,285 91.0% 81.4%
2022-2023 775 92.1% 80.1%
2023-2024 698 93.4% 84.7%
Men 2021-2022 354 91.2% 76.8%
2022-2023 269 90.7% 81.8%
2023-2024 264 93.9% 82.2%
Unknown/Masked 2021-2022 13 100.0% 100.0%
2022-2023 11 90.9% 63.6%
2023-2024 13 92.3% 76.9%
Enrollment
Retention Rate
Success Rate
< Click to go back
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Division/Area Name: Mathematics, Sciences & Engineering / Chemistry (CHEM)	For Planning Years: 2025-2026
Name of person leading this review:	
Names of all participants in this review: Harper, Schroer, Cheewawisuttichai, Hernandez	

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 nursing, respiratory and radiology programs, and many of these graduates stay in the community to work. Chemistry is also a prerequisite for various biology courses, engineering, and kinesiology courses. Students in chemistry classes complete the AS 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 *Success & Retention* and *Program Award* tabs to inform your analysis)

- What are the success and retention rates 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 *Success & Retention* tab including S&R by Ethnicity and Gender data to inform your analysis)

- Which ethnic / gender student groups complete their courses at the highest rates?
- Which ethnic / gender 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 are offering undergraduate research, honors options, and other student projects to meet student requests and interest. Faculty are supporting students to prepare posters and presentations for conferences. Additionally, these projects are serving as pilot programs to eventually incorporate into the curriculum by all instructors teaching relevant courses. CHEM 101 and 102 faculty have written new laboratory experiments that provide students with a better learning experience and strengthens the concepts learned in the lecture component of the course.

We have developed a new chemistry degree pathway. The AS-T was no longer feasible due to changes in state requirements. An AS Chemistry degree was submitted to AP&P for review.

While the success rate for AVC in general only saw an increase of 0.8% to 73.3%, the chemistry department increased success rate from 64.5% to 69.9%. This is a trend we strive to continue and attribute, in part, to incorporating more tutors into classes and hiring an innovative new faculty member.

We expanded the organic chemistry offerings to a second section due to high demand.

We adjusted the offerings of CHEM 101 (introductory chemistry) and 110 (general chemistry) to balance the true need. For some time, the demand for CHEM 110 was falsely high because students did not heed the advisory to take introductory chemistry. With support from counselors to help students take CHEM 101 first, we are now offering more CHEM 101 sections and fewer CHEM 110.

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?

Several of the chemistry faculty are approaching retirement age and discussing the need to train new faculty before it is too late.
Even now, current faculty are being pushed to teach 25 LHE per semester just to offer the number of sections traditionally available to students. When faculty decline to teach the maximum overload/load, sections of chemistry are cut which is the opposite of what the college is trying to achieve with expanding offerings and enrollment. The need for new hires is reaching a critical point.

Training for instrumentation is needed to help expand class offerings. Equipment such as hot plates, pH meters, etc. are in need. They were requested but ordered long after needed.

Book requisitions, even when submitted on time, do not result in books being available at the start of the semester. This makes it difficult for students to prepare and keep up with their classes. At the same time, not enough copies are secured, and many students must wait for weeks to obtain a copy of the book.

Chemistry faculty are discussing improvements in lab experiments for CHEM 110, 210 and 220 to incorporate lessons learned from the undergraduate pilot programs.

SLO data indicated that classes with embedded and group tutors (formerly known as Supplemental Instruction or SI) performed better than those without. In Fall 2023, two of the six CHEM 110 sections had SI, and 55% of students met SLO2 (related to topics introduced in lecture). In Spring 2024, all six sections of CHEM 110 had SI, and SLO2 was 81.5 % success. Embedded and group tutors have been requested for all classes.

However, the process to request and hire a tutor seems extensively long. Because students are in theory here only four semesters, the time it takes to interview, process, and train a tutor eats up valuable time. This cuts into the time that the tutors, personally selected by their instructors, could be working in the classroom. It also seems intrusive that the Learning Center comes into a classroom to observe a tutor without prior notification to the faculty. Based on the retention and success data, there appears to be a need for Black/African American tutors.

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?

The Chemistry Department aspires to provide quality chemical education and expose students to research grade equipment, with opportunities for undergraduate research. The department also aims to prepare students for the nursing, respiratory, or radiologic technology programs or chemistry majors. The department also looks to promote the AS degree in chemistry to help students excel in university chemistry programs and to be prepared with excellent laboratory skills which may also lead to placing students with employers in the community. Lastly, we aspire to provide students with an extensive tutoring program, through the different support services made available (i.e. The Learning Center, MESA, etc.).

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

☐ N/A

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 (CIPs) and progress toward meeting those plans.

Past Course Improvement Plans	Progress Made
Get students used to working in hands-on lab	Pilot projects related to undergraduate research are in progress with the goal to have them incorporated into future curriculua.
The current faculty are finding it difficult to cover all the classes in the schedule.	Classes have been cut from the schedule to relieve some of the stress on faculty. It is critical to hire additional faculty.
Need to meet CHEM 120 SLOs. 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 resources. Communication has already led to development of workshops on specific topics (metric prefixes, conversion factors, graphing, logarithms...).

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 chemistry awards by 15%	A local AS in chemistry has been approved to replace the AS-T that was no longer feasible with chancellor regulations.
Increase undergraduate research participation by 15%.	Faculty started research in Spring 2024 and have already prepared students to present results at research conferences.

Part 3: Based on Part 2 above, please list program/area goals:

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 Education: Expansion of offerings and effective course scheduling.	To improve student success by incorporating more hands-on activities and instrumentation in the lab classes.	Ensure adequate supplies for students in lab. Continue to support undergraduate research. Train instructors to keep updated with new equipment and techniques.	Students successfully exceed lab SLO in most courses.
#2	ILO 2. Creative, Critical, and Analytical Thinking		CHEM 110, 120, 210, 220 SLO #2		Goal #2 Equity: Improve the college culture by becoming a more caring, welcoming, accessible, and inclusive campus.	To improve student retention by working more closely with the learning center.	Coordinate with math learning specialists.	Chemistry overall has a 5% increase in success rate.
#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	$120,000	Recurring	Jedi Lobos
Supplies	Additional budget for lab supplies is essential to ensure enough materials for all students	Goal #1	Repeat	$80,000	Recurring	Maria Groth
Professional development	More training on undergraduate research design and instrumentation to achieve our goal of expanding research opportunities for students	Goal #1	Repeat	$80,000	Recurring	Thamrongsak Cheewawisuttichai
Choose an item.			Choose an item.		Choose an item.	
Choose an item.			Choose an item.		Choose an item.	

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

Required:

- Success & Retention tab
- Program Awards tab

Optional:

- Other supporting data/information

Success and Retention

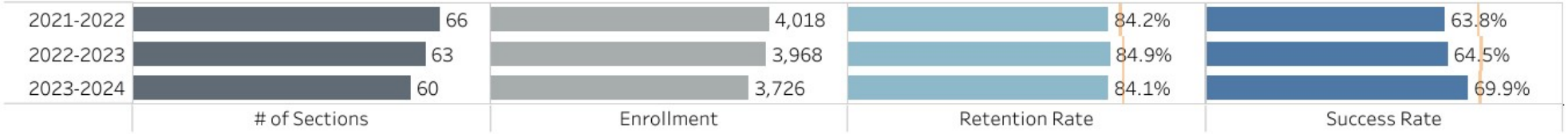
Select Academic Year: Multiple values

Select Subject: CHEM

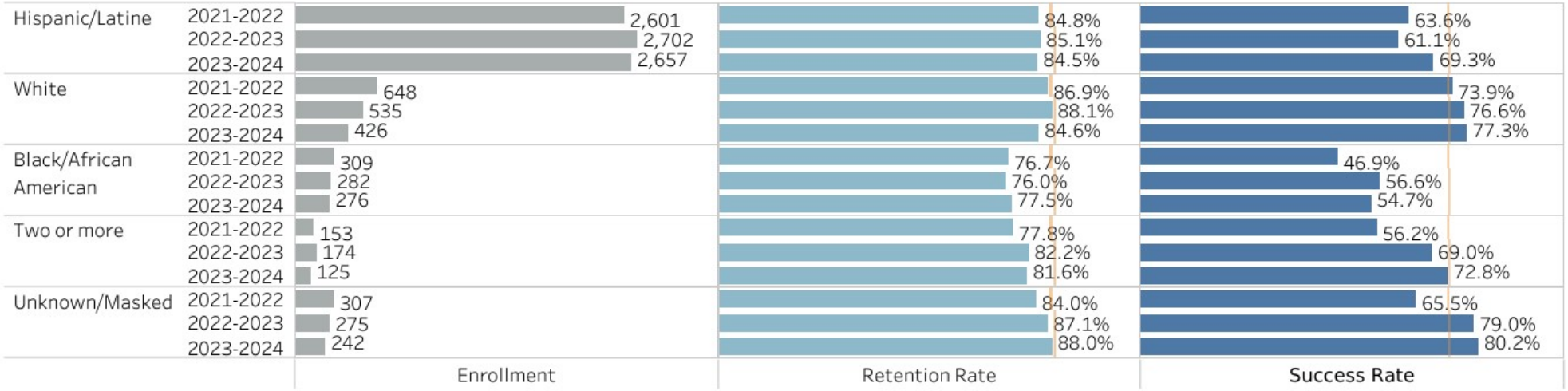
< Select subject here

AVC Retention and Success shown in vertical |

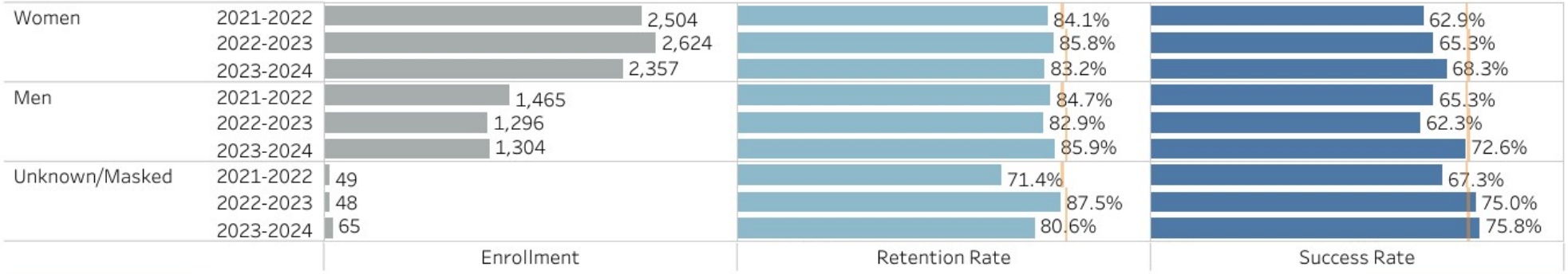
Overall Enrollments, # of Sections, Retention and Success by Year for CHEM



Enrollments, Retention & Success for CHEM by Ethnicity



Enrollment, Retention and Success for CHEM by Gender



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Program Awards

Select Academic Year: Multiple values

Select Ethnicity: All

Gender All

(Use these filters add years & disaggregate by ethnicity and gender for both of the visualizations below)

Institutional Awards

Award Type	2021-2022	2022-2023	2023-2024
AA-T/AS-T	860	734	640
AA/AS	1366	1172	1292
Certificate	1426	1115	1108
AVC Local Certificate	189	210	194
Bachelor's	13	16	21
Non-Credit	58	38	64
Grand Total	**3912**	**3285**	**3319**

Select Program Majors:
AS-T Chemistry

< Select Program Major for the chart below

Subject Awards for AS-T Chemistry

< Click to go back

Click to go next >

Grade Distribution

Academic Year
2023-2024

Subject
CHEM

Overall Grade Distribution for **CHEM**

Grades Distribution for **CHEM** by Ethnicity

Ethnicity	A,B,C, or P	D,F,NP	W	I,RD,IP	EW
Black/African American	54.7%	22.8%	21.4%	1.1%	
Hispanic/Latine	69.1%	15.1%	15.5%		0.2%
Two or more	72.8%	8.8%	18.4%		
Unknown/Masked	80.2%	7.9%	12.0%		
White	76.8%	7.3%	15.3%	0.7%	

Grade Distribution for **CHEM** by Gender

Sex	A,B,C, or P	D,F,NP	W	I,RD,IP	EW
Men	72.5%	13.2%	14.1%		0.2%
Women	68.2%	14.9%	16.7%	0.1%	0.1%
Unknown/Masked	72.3%	4.6%	18.5%	4.6%	

< Click to go back

Click to go next >

Division/Area Name: Mathematics, Sciences & Engineering / Computer Science (CS)	For Planning Years: 2025-2026
Name of person leading this review: Kyu Lee	
Names of all participants in this review: Jonathan Compton, Jedidiah Lobos	

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

(How does your program/area help the college meet its mission?)

The Computer Science program is committed to offering a diverse array of educational courses that enable students to meet associate degree requirements and seamlessly transition into advanced programs at accredited four-year institutions, including the University of California (UC) and California State University (CSU) systems. The Computer Science program is designed to provide students with programming skills in various languages for transfer to four-year universities as well as gaining access into industries across the world and provides our students a path to success.

We provide the AS-T in Computer Science degree. This program provides students with a foundational knowledge of computer science, enhances their problem-solving skills, sharpens their critical thinking and provides them with the opportunity to seamlessly transfer to a CSU in advanced standing as a Computer Science major. Furthermore, with the introduction of the Bachelor's of Science in Computer Science 2+2 Pathway from AVC to California State University Bakersfield, the AS-T provides an opportunity to educate and train students in Computer Science at AVC and prepare them for transfer to a quality program in the Antelope Valley. This will not only provide students with a low-cost quality education but may lead to increasing the local STEM workforce. Also, the Programming Fundamentals Certificate provides both academic preparation for and a pathway to internships. When combined with further study, it may lead to the Computer Science Associate in Science Degree (AS), Computer Science Associate in Science for Transfer (AS-T), and/or transfer to four-year institutions.

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 *Success & Retention* and *Program Award* tabs to inform your analysis)

- What are the success and retention rates 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 *Success & Retention* tab including S&R by Ethnicity and Gender data to inform your analysis)

- Which ethnic / gender student groups complete their courses at the highest rates?

- Which ethnic / gender 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 S*trengths and Accomplishments* section.

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

- What are the success and retention rates for your discipline? Did they decrease or increase in the last year?
    - For Computer Science, there is only 2023-2024 program review data. The 2023-2024 success rate of Computer Science was 65.3%. It was lower than CS 2023-2024 success and retention Data (85.8%)
- What are the trends for the number of awards granted? Are the number of awards going up or down?
    - Since 2021-2022, the number of awards have continuously gone up.
- Which ethnic / gender student groups complete their courses at the highest rates?
    - The group "unknown or masked" has the highest rate, which is 79.3%. The 2nd highest group is "white" which is 70.8%. However, the enrollment numbers for the highest rate group are relatively lower than those of the other groups, which have the majority of enrollments.
- Which ethnic / gender 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 S*trengths and Accomplishments* section.
    - The ethnic group that has the largest gaps is "Black/African American" group which is 48.7%. However, when we compare the absolute number of students, the non-successful number of students of lowest versus highest group is 6.7: 172.38. The relatively low number of enrollments does not accurately reflect the actual success rate.

Consider the following questions:

- What does your program/area do well, including capabilities and greatest accomplishments?
    - For the first academic year of the Computer Science program, the success and retention rates are quite good. The retention rate is 79.5%, while the success rate is 65.3%. These rates are almost the same as the CIS (what is now CS) data for 2022-2023.
- What are the practices that were implemented to increase success and retention rates or program awards?
    - To increase success and retention rates, CS students are encouraged to participate in extracurricular activities such as the STEM club, SWE (Society of Women Engineers), and volunteer opportunities at Division events. These experiences not only enhance learning but also build a sense of community and support among students.

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?
    - To achieve an 80% success and retention rate for the 2024-2025 academic year, all faculty members in the CS department will periodically share course plans, content, and peer feedback. To minimize variation between sections of the same course, we will establish a shared communication pool where instructors can collaboratively refine and align course materials. This approach ensures consistency and supports student success across all course sections.
- What actions can be taken to help close equity gaps?

- We provide various course modalities, including online, hybrid, and in-person courses. We believe that the variety in course modality will allow students who do not have the opportunity to make it to campus, the ability to take CS courses.
- In the Computer Science program, we provide active learning strategies, such as group work, hands-on projects, and creating a supportive learning environment.

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?
  - The Computer Science program aims to be recognized as a well-prepared educational pathway for AS-T degrees and Certified Technical Programs. Upon completing the program, students will be prepared for the skills needed to achieve industry certifications and be fully ready to transfer to four-year higher education institutions.
- What is a desired future?
  - The Computer Science program aims to expand partnerships with leading tech companies like Amazon and Cisco, establishing collaborations that enhance educational resources and opportunities for students through industry-aligned training and mentorship.

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

☒ N/A

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/

Projections of Employment by Occupation, 2020 - 2030

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)	2020 Employment	Annual Job Openings[1]

113021	Computer and Information Systems Managers	94,700	99,920
251021	Computer Science Teachers, Postsecondary	1,900	2,040
	Total	96,600	101,960

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

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

Providing student-oriented teaching practices such as differentiated instruction and flexible options for assignments	The CS courses started to adopt the various course contents. 80%
Increase connectivity and engagement	80%. Utilized various tools for strong connectivity with students.
Utilize supplementary tools such as counseling systems and tutoring.	80%. Encourage students to participate in the Students Learning Center and Counselling Center.

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**
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.	While these gaps still persist, great strides are being made to promote the CS pathways.
To continue to help a greater number of AVC students transfer to 4-year institutions and join the workforce.	With the development of the Bachelor's of Science in Computer Science 2+2 Pathway from AVC to California State University Bakersfield, there is now another, lower-cost transfer option for students to benefit from.

Part 3: Based on Part 2 above, please list program/area goals:								
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	Design, create and test a program in a high-level, object-oriented, programming language based on a given set of specifications .	Plan, code, test, and debug small programs using C programming to solve real-world scientific, engineering and business problems.	Provide the computer resources to and tutoring support	Goal #4 Vision: Being more future-thinking, agile, innovative, and proactive.	Students can develop an algorithm to solve the real-world problem.	- Read the course materials and textbook resources - Watch the Linked-in Learning Videos - Provide the various levels of programming projects to achieve the goals - Test and Debug their programs to prove the accurate result for all combinations of input values - Students-to-students communication through the discussion	- SLO Quizzes - Test program results(Pass / No pass)
#2	ILO 4. Career and Specialized Knowledge	Design, create and test a program in a high-level, object-	Plan, code, run, debug, and document programs written in	Increase the communication between students	Goal #4 Vision: Being more future-thinking, agile,	Students can develop the Assembly Program from the high-level	- Read the course materials and textbook resources - Watch the Linked-in Learning Videos	- SLO Quizzes - Test program results(Pass / No pass) - Participation Degree

		oriented, programming language based on a given set of specifications .	assembly language.	and instructor	innovative, and proactive.	language program. Students-to-Students and Students-to-Instructor communication to learn the number representation systems.	- Provide the various levels of programming projects to achieve the goals - Test and debug assembly programs to prove the accuracy of the result. - Group work to complete the team project.	
#3	ILO 4. Career and Specialized Knowledge	Solve the common problems in the Binary and Hexadecimal number systems	Describe the computer processor's fetch, decode and execute cycle and indicate how an interrupt is handled.	- Student will have proactive and creative thing way. - Increase the engagement through the course activities.	Goal #6 Success: Boost success rates by prioritizing the student experience.	- Students can develop the Machine Code Instructions to solve the real-world problems. - Understanding Machine code format. - Understanding the number representation systems - Students will experience communication skills through the team project - Increasing Student's engagement	- Provide the team programming projects to achieve the goals - Test and debug assembly programs to prove the accuracy of the result. - Increasing group communication skills within the team project.	- SLO Quizzes - Test program results (Pass / No pass) - Team Communication Degree

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	Embedded Online Whiteboard in Canvas	#2, #3	New	$0	One-time	IT Department
Physical/Facilities	Linux Computer Labs	#1, #2, #3	New	$20,000	One-time	Amazon/Bestbuy
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.	

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

Required:

- Success & Retention tab
- Program Awards tab

Optional:

- Other supporting data/information

Success and Retention

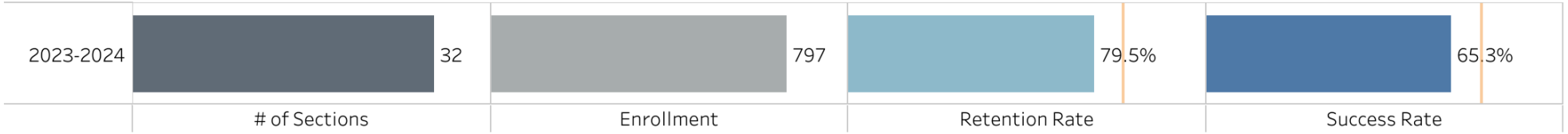
Select Academic Year:
Multiple values

Select Subject:
CS

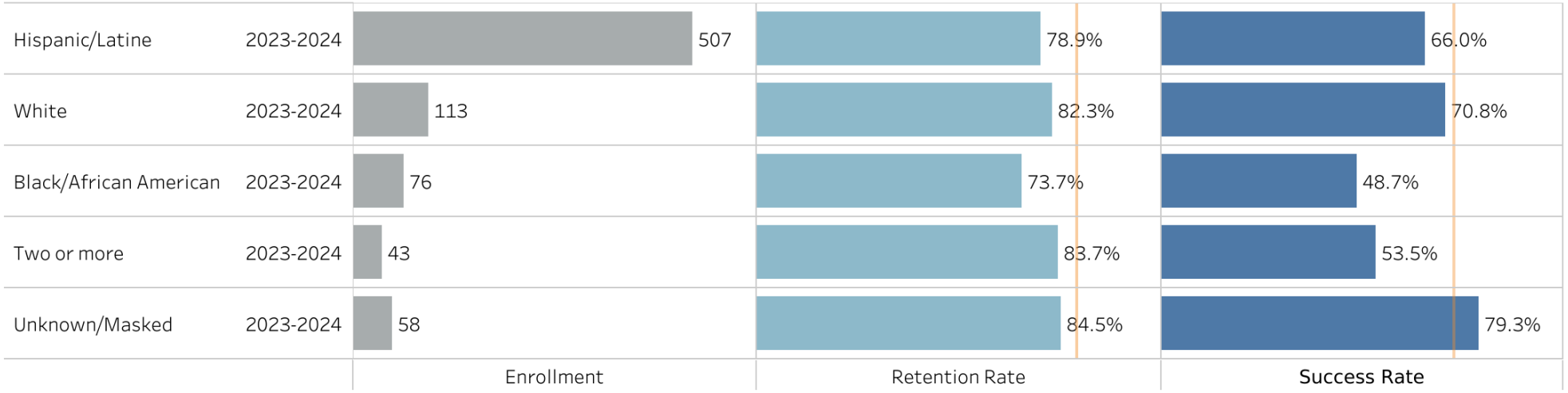
< Select subject here

AVC Retention and Success shown in vertical |

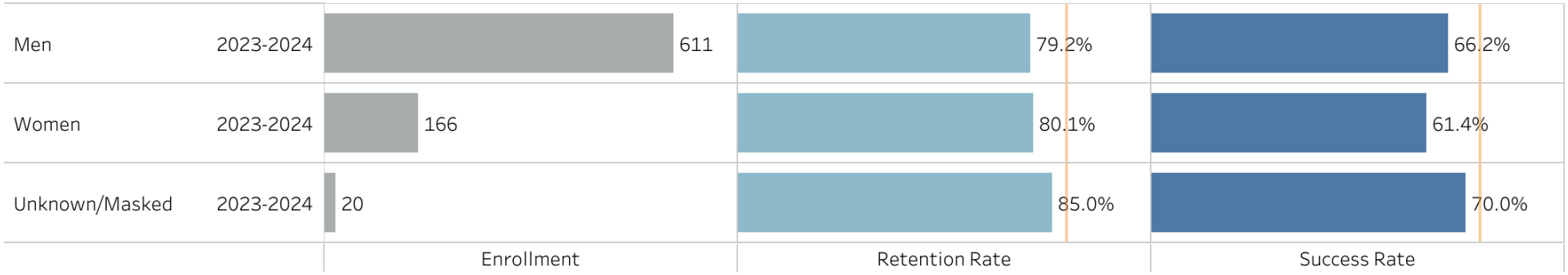
Overall Enrollments, # of Sections, Retention and Success by Year for CS



Enrollments, Retention & Success for CS by Ethnicity



Enrollment, Retention and Success for CS by Gender



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Success and Retention

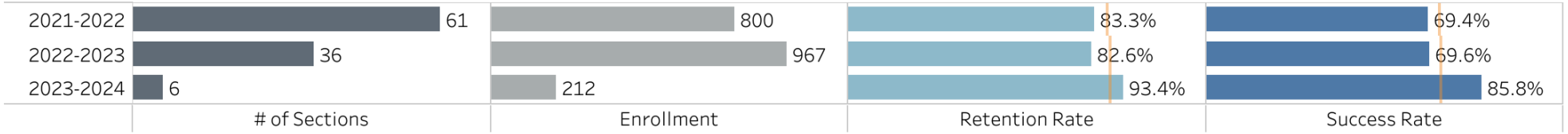
Select Academic Year:
Multiple values

Select Subject:
CIS

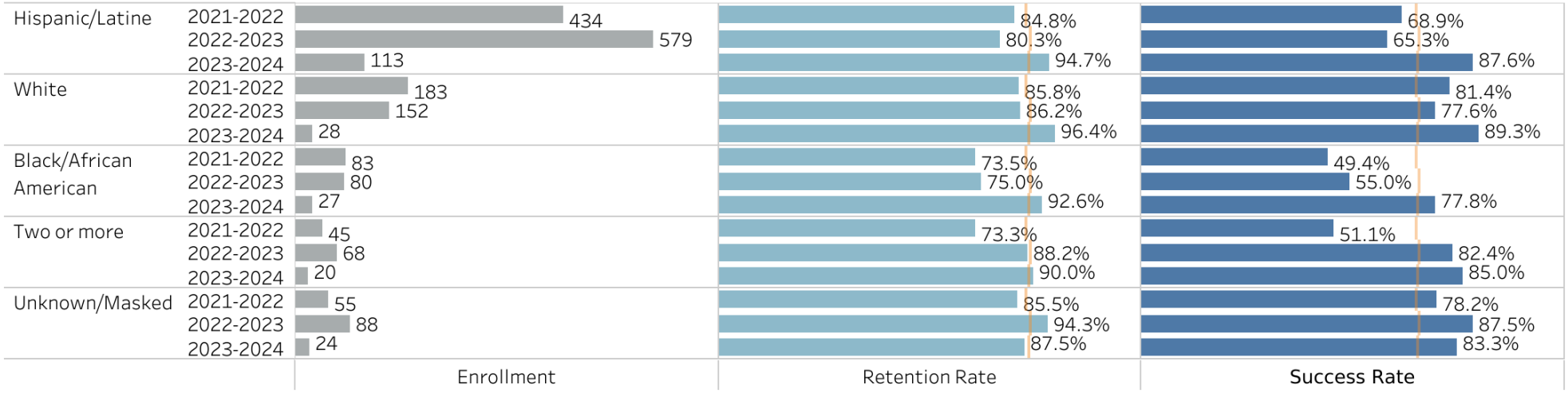
< Select subject here

AVC Retention and Success shown in vertical |

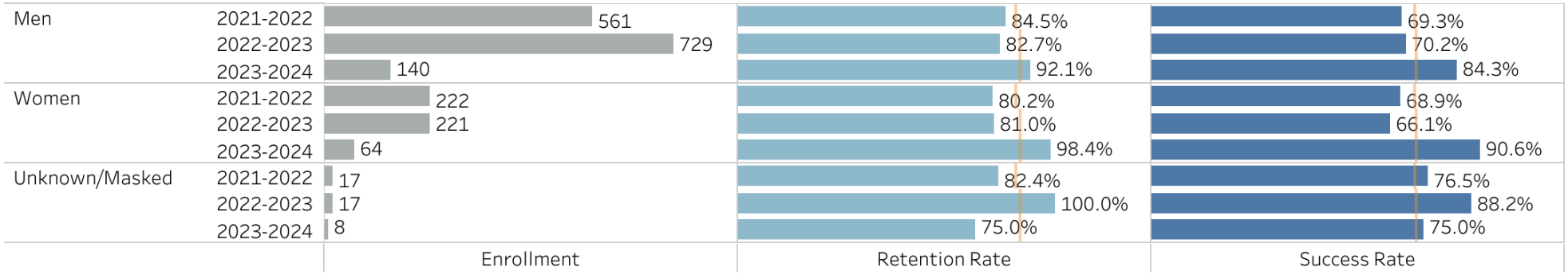
Overall Enrollments, # of Sections, Retention and Success by Year for CIS



Enrollments, Retention & Success for CIS by Ethnicity



Enrollment, Retention and Success for CIS by Gender



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Click to go next >

Program Awards

Select Academic Year: Multiple values

Select Ethnicity: All

Gender: All

(Use these filters add years & disaggregate by ethnicity and gender for both of the visualizations below)

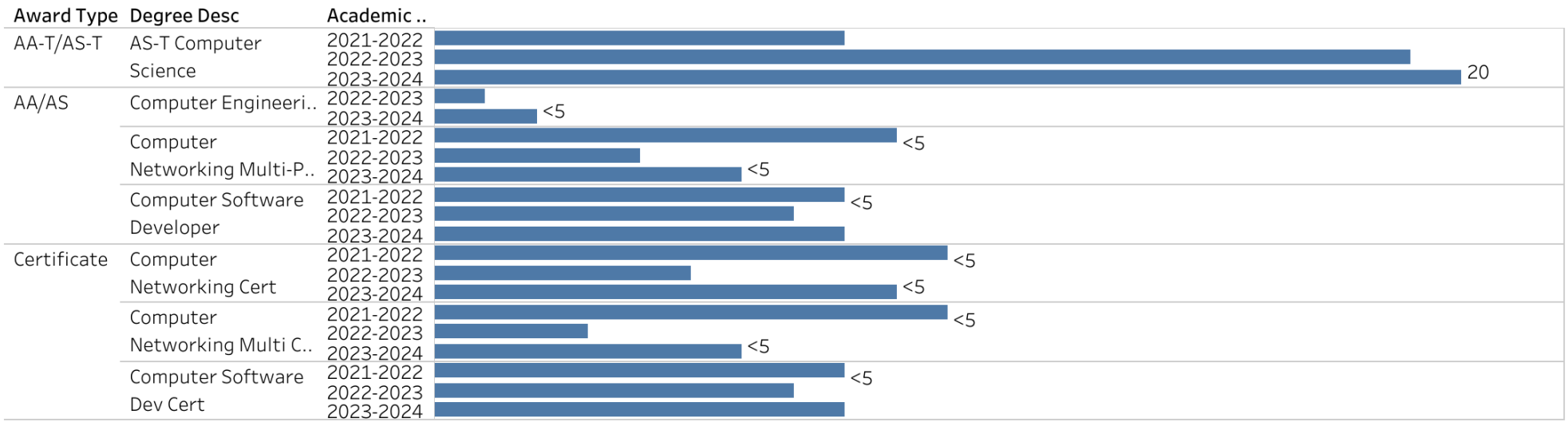
Institutional Awards

Award Type	2021-2022	2022-2023	2023-2024
AA-T/AS-T	860	734	640
AA/AS	1366	1172	1292
Certificate	1426	1115	1108
AVC Local Certificate	189	210	194
Bachelor's	13	16	21
Non-Credit	58	38	64
Grand Total	**3912**	**3285**	**3319**

Select Program Majors: Multiple values

< Select Program Major for the chart below

Subject Awards for AS-T Computer Science, Computer Engineering, Computer Networking Cert and 4 more



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Fall 2024 Program Review Report | Instructional Areas

Division/Area Name: Mathematics, Sciences & Engineering / Engineering (ENGR)	**For Planning Years: 2025-2026**
Name of person leading this review: Jonathan Compton	
Names of all participants in this review: Alexandra Schroer, Jedidiah Lobos	

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

The Engineering program at Antelope Valley College (AVC) contributes to the district mission by supporting: 1) students seeking career technical education to enter the engineering workforce through various specialized certificates and degrees, and 2) students aiming to transfer to four-year universities under engineering transfer degrees by providing the essential coursework required for such transitions.

The faculty and staff of the Engineering Department are committed to offering students hands-on training necessary for skill certification, continuing education classes, professional development, and the opportunity to master the fundamentals required to excel in engineering disciplines. Courses are designed for students who wish to complete a two-year degree or certificate and 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 *Success & Retention* and *Program Award* tabs to inform your analysis)

- What are the success and retention rates 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 *Success & Retention* tab including S&R by Ethnicity and Gender data to inform your analysis)

- Which ethnic / gender student groups complete their courses at the highest rates?
- Which ethnic / gender 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 S*trengths and Accomplishments* section.

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

Overall Analysis

Success & Retention Rates:

- **Retention Rates:** The retention rate for ENGR courses has shown a significant increase over the last year, rising from 87.8% to 93.2%. This indicates improved student persistence in the program.
- **Success Rates:** The success rate has been relatively stable, with a slight increase from 74.8% to 78.8% over the first three years, followed by a small dip to 78.1% in the most recent year.

Trends for Program Awards:

Over the past four years, the number of degrees awarded in the Engineering program has fluctuated: 21, 20, 33, 26

Analysis:

- **Increase in Awards:** There was a significant increase in the number of degrees awarded in the third year, rising to 33 from the previous year's 20. This suggests a peak in student completions during that period.
- **Recent Decline:** The number of awards decreased to 26 in the most recent year, which, while lower than the peak, is still higher than the first two years.

Equity Analysis

By Gender:

- **Enrollment:** Male students consistently outnumber female students, with a slight increase in male enrollment and a decrease in female enrollment over the four years.
- **Retention Rates:** Retention rates are nearly identical for both genders, indicating equitable persistence.
- **Success Rates:** Female students had a notable peak in success rates at 83.9% in the third year but dropped to 73.0% in the most recent year. Male students' success rates have been more stable, with a slight increase to 78.7%.

By Ethnicity:

- **Enrollment:** Hispanic students form the largest ethnic group, followed by White and Black students. Enrollment for Hispanic students has increased, while it has decreased for White and Black students.
- **Retention Rates:** Retention rates for Hispanic and White students are high and have improved over the years. Black students showed a significant improvement, reaching 100% retention in the most recent year.
- **Success Rates:** White students consistently have the highest success rates, although there was a slight decline in the most recent year. Hispanic students' success rates have improved but remain lower than White students. Black students have the lowest success rates, with a significant drop in the second and third years, followed by a slight improvement.

Strengths

- **High Retention Rates:** The program has achieved high and improving retention rates, indicating strong student engagement and support.
- **Stable Success Rates:** Despite some fluctuations, success rates have remained relatively stable, suggesting effective teaching and learning strategies.

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

Opportunities

- **Addressing Gender Disparities:** There is an opportunity to investigate and address the reasons behind the recent decline in female students' success rates.
- **Supporting Black Students:** Targeted support and interventions are needed to improve the success rates of Black students, who have experienced significant challenges.

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

Aspirations

- **Equitable Success:** The program aims to achieve equitable success rates across all demographic groups, ensuring that all students have the support they need to succeed.
- **Increased Female Enrollment:** Efforts to attract and retain more female students in the engineering program will help balance gender representation.

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

☒ N/A

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** (CIPs) and progress toward meeting those plans.

Course	SLO Achievement Target	Past SLO Performance	Actual SLO Performance	Change from previous SLO Performance
ENGR 110	70%	74.00%	85.47%	+15.5
ENGR 125	70%	88.46%	88.00%	-0.5
ENGR 130	70%	96.16%	89.29%	-7.1
ENGR 140	70%	94.74%	84.93%	-10.4
ENGR 185	70%	69.23%	N/A	N/A
ENGR 210	70%	89.74%	95.24%	+6.1
ENGR 230	70%	94.83% / 93.10%	N/A	N/A

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 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.

To enhance the success of SLOs in the Introduction to Engineering course and digital logic design course, it is important to ensure that assessments are accurate to ensure the achievement of SLOs. When defining clear and measurable SLOs, the first thing that needs to be done is to ensure that they are aligned with the course objectives in order for the objectives to be monitored and tracked. The information that students have acquired can be directly measured through assessments that are based on their knowledge of the assignments and projects they are involved in and are based on their understanding of them rather than the assigned assessment in a single area. It is important to use rubrics and criteria in order to ensure consistency in the evaluation process. A more regular analysis of data and more transparent communication of assessment results will allow us to make better decisions. For precision, improving student learning, and improving the quality of the program as a whole, it is essential to develop action plans based on assessment data. More comprehensive collaboration among individual engineering faculties with the experienced discipline leader in the development of SLOs based on former assessment data is crucial for precision, leading to improved student learning and program quality.

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	While we had a decrease from last year, we were overall above the previous 4 years. 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 our courses count.
Enhance the writing and communication skills of engineering students	The results of this goal have been positive. We have students writing more reports in lab courses and our Introduction course. This has exposed students to technical writing to aid in their skills.
To elevate the proficiency of students in advanced Engineering 3D design	We are still in progress on this goal. Time limitations have prevented this goal from being completed. We look forward to continuing with this goal and completing it in the upcoming year.

Part 3: Based on Part 2 above, please list program/area goals:								
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 #5 Education: Expansion of offerings and effective course scheduling.	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 our courses count.	Compare our number of completions to previous years.
#2	ILO 4. Career and Specialized Knowledge				Goal #4 Vision: Being more future-thinking, agile, innovative, and proactive.	Increase the hands-on offerings for Engineering students	Implement newly developed noncredit courses and increase awareness of the courses.	Examine the number of certificate completions for these noncredit course pathways
#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	We need additional faculty in the bottleneck courses (ENGR and PHYS) to help increase student throughput.	1	New	Faculty salary cost $100,000 per year	Recurring	Jonathan Compton
Technology	We need equipment and supplies to support hands-on lab courses for ENGR.	2	New	$100,000	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.	

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

Required:

- Success & Retention tab
- Program Awards tab

Optional:

- Other supporting data/information

Success and Retention

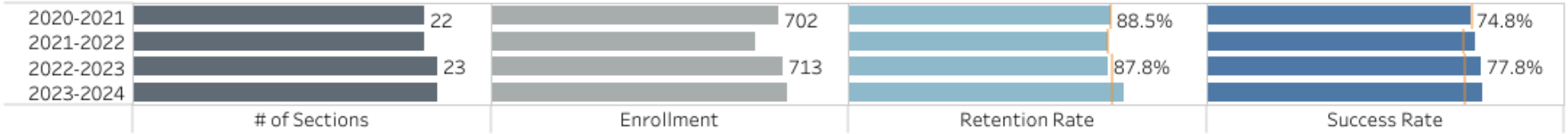
Select Academic Year: Multiple values

Select Subject: ENGR

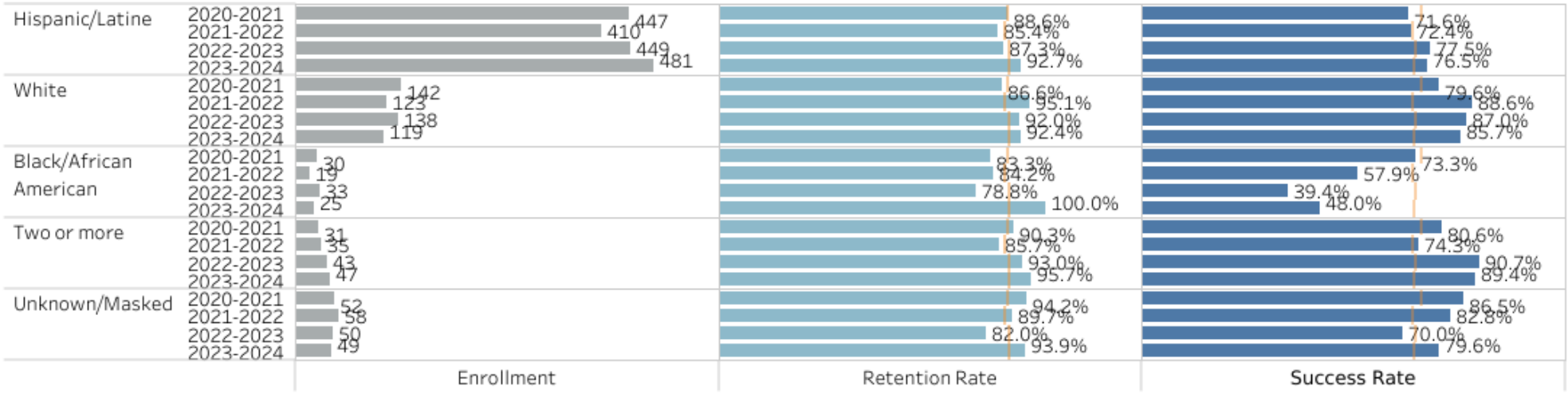
< Select subject here

AVC Retention and Success shown in vertical |

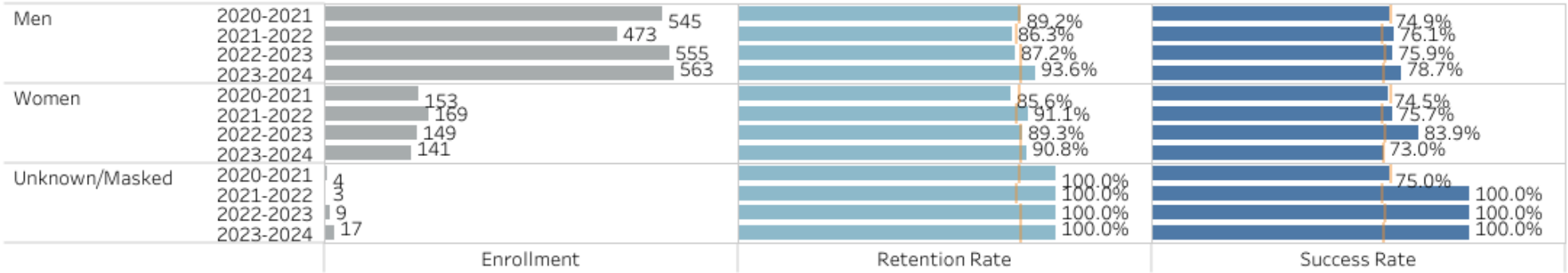
Overall Enrollments, # of Sections, Retention and Success by Year for ENGR



Enrollments, Retention & Success for ENGR by Ethnicity



Enrollment, Retention and Success for ENGR by Gender



< Click to go back

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Program Awards

Select Academic Year: Multiple values

Select Ethnicity: All

Gender All

(Use these filters add years & disaggregate by ethnicity and gender for both of the visualizations below)

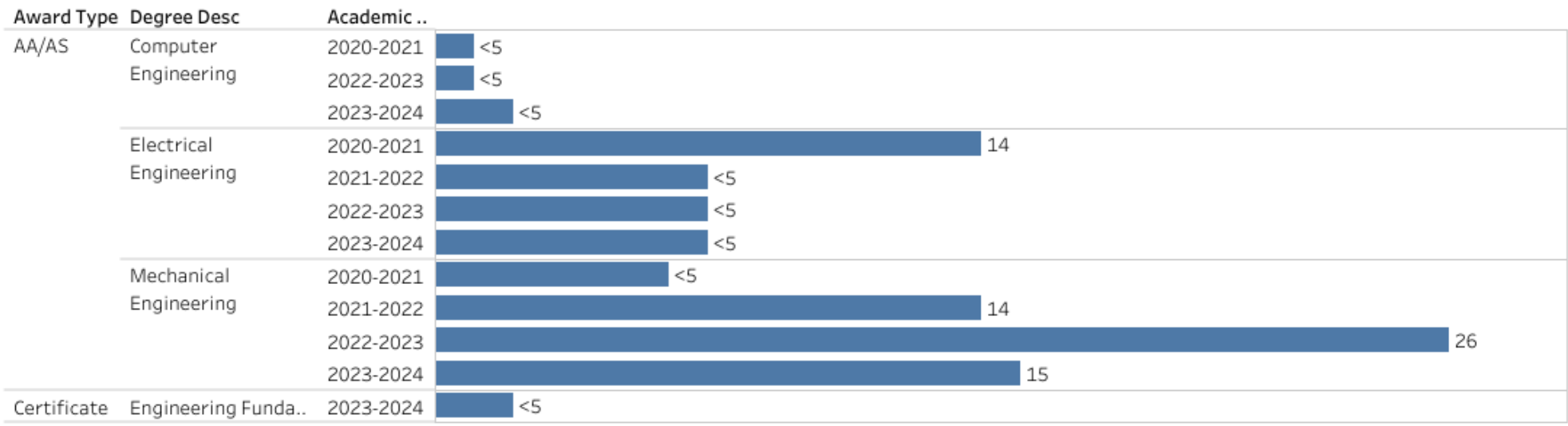
Institutional Awards

Award Type	2020-2021	2021-2022	2022-2023	2023-2024
AA-T/AS-T	790	860	734	640
AA/AS	1184	1366	1172	1292
Certificate	1223	1426	1115	1108
AVC Local Certificate	159	189	210	194
Bachelor's	16	13	16	21
Non-Credit	82	58	38	64
Grand Total	**3454**	**3912**	**3285**	**3319**

Select Program Majors: Multiple values

< Select Program Major for the chart below

Subject Awards for Computer Engineering, Electrical Engineering, Engineering Fundamentals and 1 more



< Click to go back

Click to go next >

Program Awards

Select Academic Year: Multiple values

Select Ethnicity: All

Gender Women

(Use these filters add years & disaggregate by ethnicity and gender for both of the visualizations below)

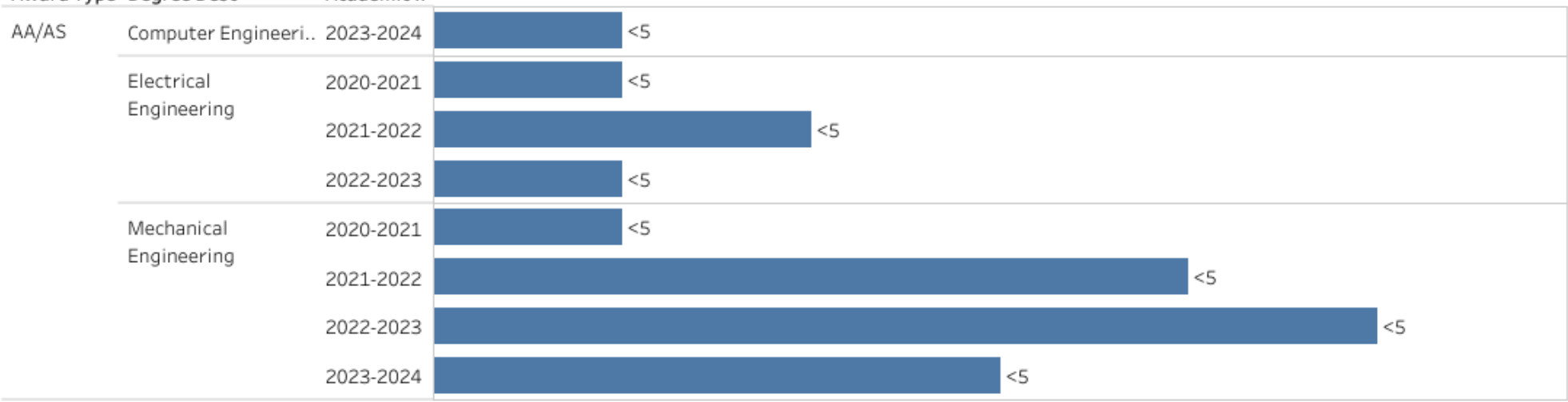
Institutional Awards

Award Type	2020-2021	2021-2022	2022-2023	2023-2024
AA-T/AS-T	511	553	444	394
AA/AS	753	886	725	739
Certificate	667	801	616	560
AVC Local Certificate	49	47	45	38
Bachelor's	<5	<5	<5	8
Non-Credit	62	47	32	50
Grand Total	**2044**	**2339**	**1865**	**1789**

Select Program Majors: Multiple values

< Select Program Major for the chart below

Subject Awards for Computer Engineering, Electrical Engineering, Mechanical Engineering



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Program Awards

Select Academic Year: Multiple values

Select Ethnicity: Black/African American

Gender All

(Use these filters add years & disaggregate by ethnicity and gender for both of the visualizations below)

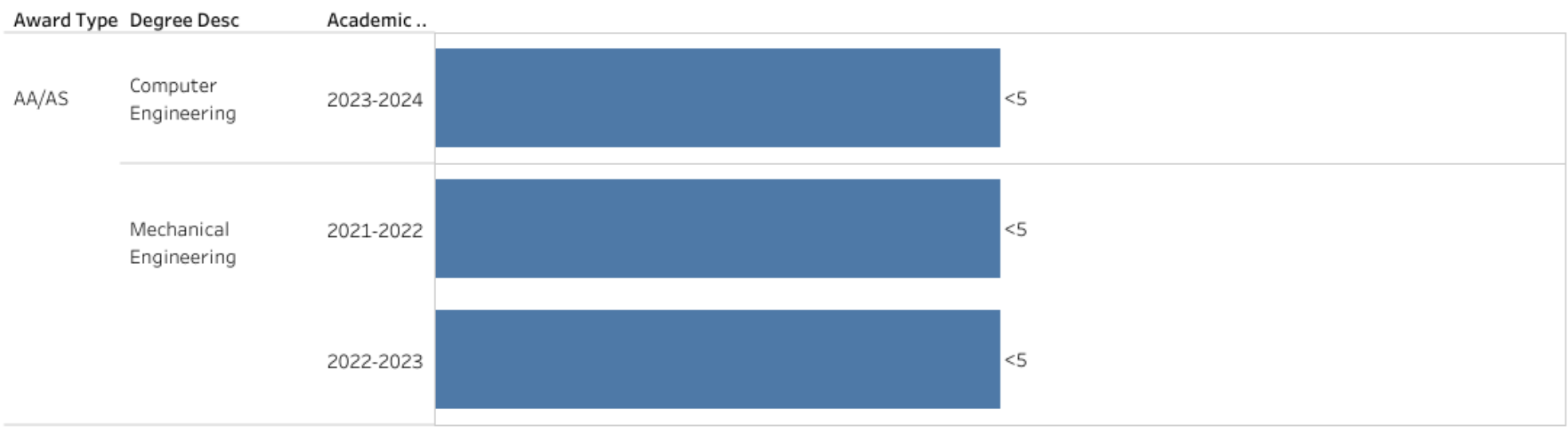
Institutional Awards

Award Type	2021-2022	2022-2023	2023-2024
AA-T/AS-T	83	65	54
AA/AS	131	95	141
Certificate	115	82	109
AVC Local Certificate	10	11	16
Non-Credit	<5	<5	<5
Grand Total	**340**	**255**	**321**

Select Program Majors: Multiple values

< Select Program Major for the chart below

Subject Awards for Computer Engineering & Mechanical Engineering



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Program Awards

Select Academic Year: Multiple values

Select Ethnicity: Hispanic/Latine

Gender All

(Use these filters add years & disaggregate by ethnicity and gender for both of the visualizations below)

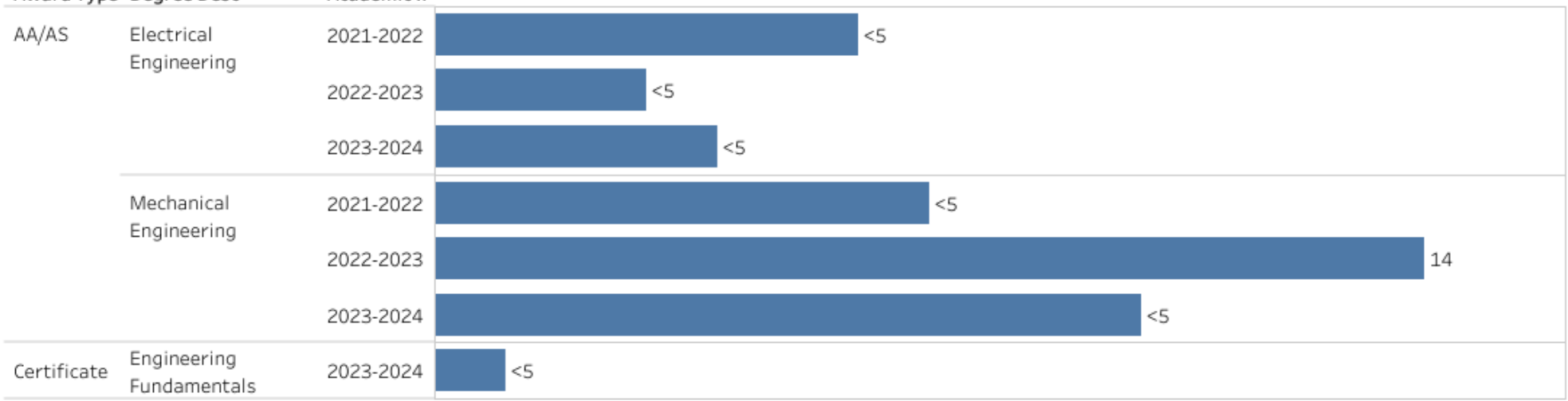
Institutional Awards

Award Type	2021-2022	2022-2023	2023-2024
AA-T/AS-T	487	440	381
AA/AS	766	729	765
Certificate	830	731	698
AVC Local Certificate	126	162	133
Bachelor's	8	11	17
Non-Credit	31	24	40
Grand Total	**2248**	**2097**	**2034**

Select Program Majors: Multiple values

< Select Program Major for the chart below

Subject Awards for Electrical Engineering, Engineering Fundamentals, Mechanical Engineering



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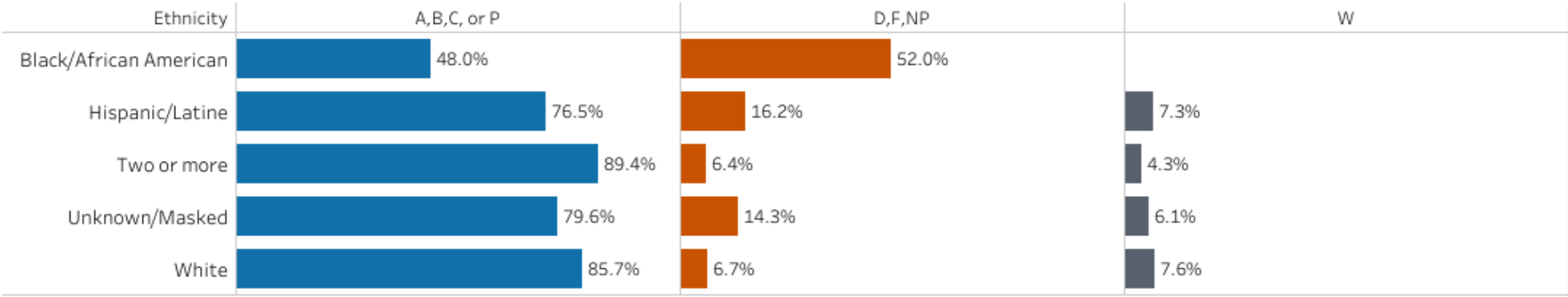
Grade Distribution

Academic Year
2023-2024

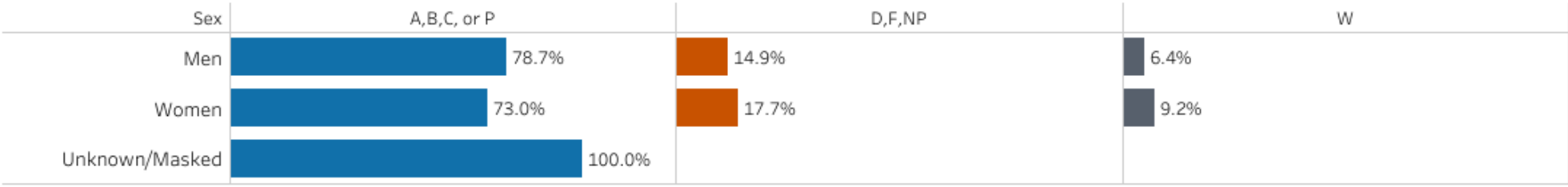
Subject
ENGR

Overall Grade Distribution for ENGR

Grades Distribution for ENGR by Ethnicity



Grade Distribution for ENGR by Gender



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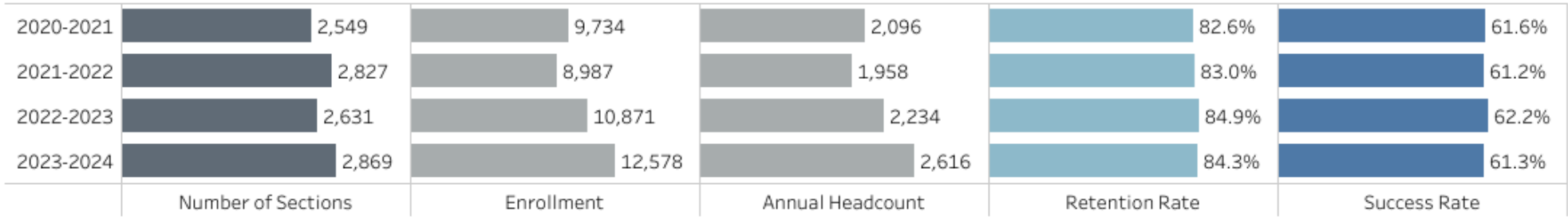
Institutional Success & Retention

The following shows AVC's success, retention, enrollment, and headcount. Use the filters below to disaggregate by ethnicity and gender. If you are interested in including additional years, you can use the 'Academic Year' filter.

Academic Year	Ethnicity	Gender	Modality
Multiple values	Black/African American	All	All



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Institutional Success & Retention

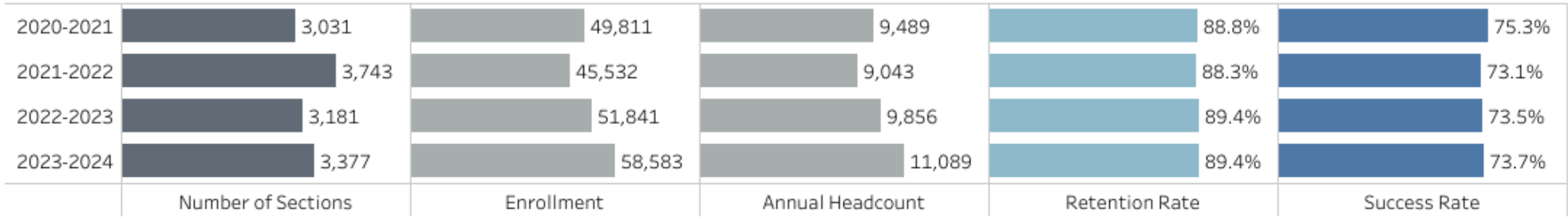
The following shows AVC's success, retention, enrollment, and headcount. Use the filters below to disaggregate by ethnicity and gender. If you are interested in including additional years, you can use the 'Academic Year' filter.

Academic Year
Multiple values

Ethnicity
Hispanic/Latine

Gender
All

Modality
All



< Click to go back

Institutional Success & Retention

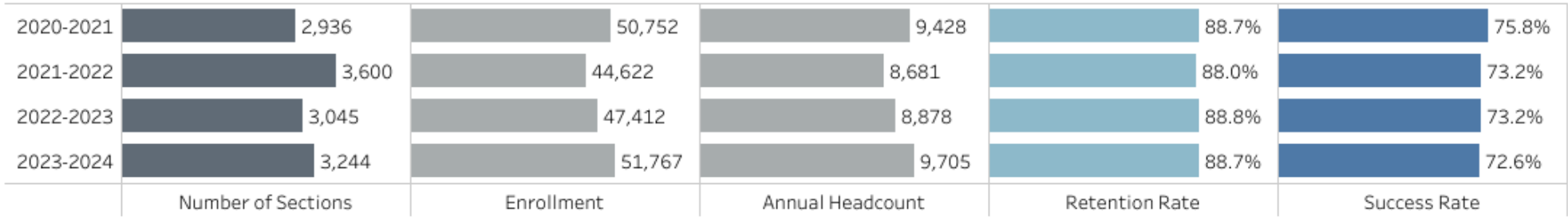
The following shows AVC's success, retention, enrollment, and headcount. Use the filters below to disaggregate by ethnicity and gender. If you are interested in including additional years, you can use the 'Academic Year' filter.

Academic Year
Multiple values

Ethnicity
All

Gender
Women

Modality
All



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Division/Area Name: Mathematics, Sciences & Engineering / Geosciences (GEOG, GEOL)	For Planning Years: 2025-2026
Name of person leading this review: Dr. Aurora Burd	
Names of all participants in this review: Dr. Aurora Burd, Dr. Mike Pesses	

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 associates 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 *Success & Retention* and *Program Award* tabs to inform your analysis)

- What are the success and retention rates 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 *Success & Retention* tab including S&R by Ethnicity and Gender data to inform your analysis)

- Which ethnic / gender student groups complete their courses at the highest rates?
- Which ethnic / gender 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 S*trengths 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 (as reported last year, now reported as 480 – this number seems incorrect because there were roughly 7 sections with max enrollment of 48 students each, which should be a max of about 336 students – it's unclear why the dashboard is showing 480 online students for GEOL for 2022-2023). Success rates have stayed about the same 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?

As noted last year, 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 actually 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 change in our classes and degree programs.

The Program Review data attached at the end of this document no longer lists which campus is offering the classes. However, Palmdale Center no longer attempts to offer geoscience classes, because not only are they regularly canceled due to low enrollment, some labs are 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, in an attempt 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. The current dashboard also shows 139 students took ERSC 101 in-person during 2022-2023, which doesn't make sense since there were only four 24-person sections offered that year (and two of them were blended, which should have counted as online).

Instructors continue to try to keep courses up to date, but AVC's dated technology and lack of support is greatly complicating this process.

In particular, all geoscience courses need to be continually updated with current data related to climate change, geologic resources, ENSO status, drought status, and recent earthquakes, as well as updates to our understanding of these events or phenomena. To do this for online classes, it is necessary to update lecture

videos and other content. One instructor recently discovered that their AVC-issued computer is too old to export Camtasia project files into video format (to be uploaded to Yuja, then embedded in Canvas). The only workaround has been for the instructor to place the Camtasia project file on a thumb drive, hand carry it to Alex Parisky, and have him do the export on his AVC-issued computer. This is a waste of instructor (and instructional designer) time and resources. This instructor needs their AVC-issued computer refreshed so that they can continue to produce high quality content using the most up-to-date video software offered by the college (producing videos in Zoom as was done during the pandemic is dated and low quality).

In addition to updating material, our geoscience-specific technology has had issues in terms of payments to the appropriate vendors. For some reason, our ArcGIS Pro annual license was not paid last year, and once this was mentioned it took weeks for a payment to take place. As a result, students enrolled in GIS classes were without the software they needed for half the class, making that half useless. We need to ensure that the geosciences are not an afterthought when it comes to keeping technology paid for and accessible by our students.

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 the 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

☐ N/A

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

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, 2020 - 2030

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")	2020 Employment	Annual Job Openings (1)
192042	Geoscientists, Except Hydrologists and Geographers	3,400	3,870
119121	Natural Sciences Managers	11,000	10,650
252031	Secondary School Teachers, Except Special and Vocational Education	97,500	75,950
	Total	111,900	90,470

(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, 2020 - 2030

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")	2020 Employment	Annual Job Openings (1)
251051	Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary	390	370
192042	Geoscientists, Except Hydrologists and Geographers	450	480
119121	Natural Sciences Managers	1,280	1,170
252031	Secondary School Teachers, Except Special and Vocational Education	19,920	15,280
	Total	22,040	17,300

(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, 2020 - 2030

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")	2020 Employment	Annual Job Openings (1)
192042	Geoscientists, Except Hydrologists and Geographers	200	200
119121	Natural Sciences Managers	50	50
252031	Secondary School Teachers, Except Special and Vocational Education	2,540	2,270
	Total	2,790	2,520

(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** (CIPs) and progress toward meeting those plans.

Past Course Improvement Plans	Progress Made
GEOG 205: Consistent access to technology	Missing and late payments for the technology that is crucial for student success have kept our GIS students from being able to complete meaningful work. We are sorting through who is in charge of these payments to ensure that everything works at the start of each semester.

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 the 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 in order 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 of these 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). In particular, 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	David Bermea is an excellent lab technician and he seems to have enough time to prep the current main campus geoscience offerings, so a lab technician dedicated to ERSC/GEOL/GEOG may not be necessary.

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 in particular, 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 at this time 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:

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 #5 Education: Expansion of offerings and effective course scheduling.	Continue to recruit students to the GIS Program	1. High School outreach 2. Offer more sections of GEOG 205 to allow students to begin the GIS Certificate in Intersession and Spring	When we have multiple cohorts for the GIS Program running in the same academic year.
#2	ILO 2. Creative, Critical, and Analytical Thinking				Goal #6 Success: Boost success rates by prioritizing the student experience.	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 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 #6 Success: Boost success rates by prioritizing the student experience.	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 maps, and store them in the available lab space.	When supplies are purchased, organized, and deployed to the Main Campus.
#4	ILO 2. Creative, Critical, and Analytical Thinking				Goal #6 Success: Boost success rates by prioritizing the student experience.	Hire full-time and adjunct faculty to cover currently available courses.	Hire faculty.	No courses canceled due to lack of instructor.
#5	ILO 2. Creative, Critical, and Analytical Thinking				Goal #4 Vision: Being more future-thinking, agile, innovative, and proactive.	Continue to produce up-to-date lecture videos and content for asynchronous online courses, featuring best practices for online instruction and up-to-date data related to climate change, recent	Refresh instructors' AVC-issued computer so it can export Camtasia project files to video format, which is not currently possible on their AVC-issued devices.	Instructors can export their own videos on their AVC-issued computers instead of carrying the project file on thumb drive to Alex Parisky to have him export it.

						earthquakes, ENSO status, etc.		

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	$69997 – $96215	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	$5000	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
Technology	Computer refresh for Dr. Burd so that she can export Camtasia project files to video format to keep online course lecture videos up to date.	#5	New	$3000	One-time	Dr. Burd
Physical/Facilities	Secure a quiet room suitable for recording high quality audio and video content for online classes in order to not have background noises like students shouting in the hallways or neighboring faculty phone calls. Minimal cost to soundproof room, install webcam, microphone, and appropriate lighting.	#5	New	$1000	One-time	Dr. Pesses

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

Required:

- Success & Retention tab
- Program Awards tab

Optional:

- Other supporting data/information

Success and Retention

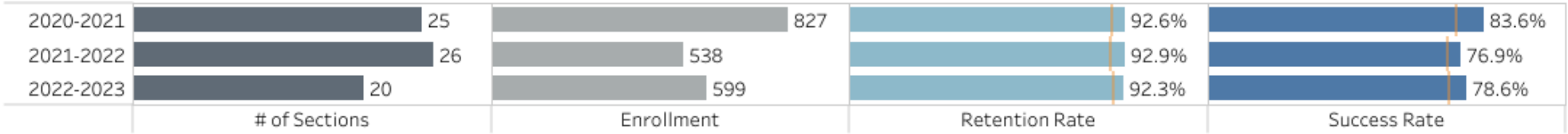
Select Academic Year: Multiple values

Select Subject: GEOG

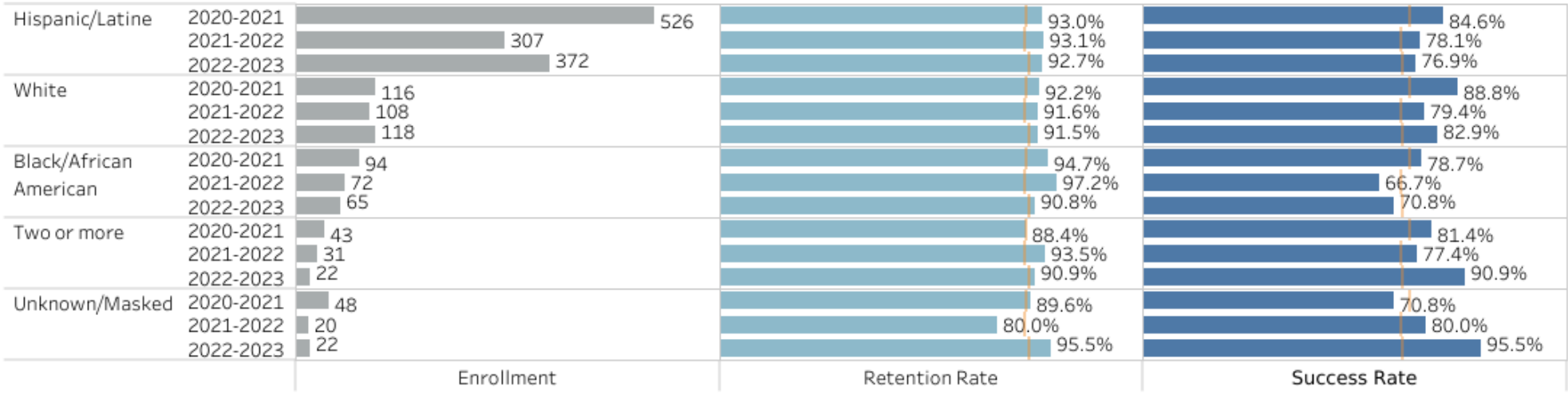
< Select subject here

AVC Retention and Success shown in vertical |

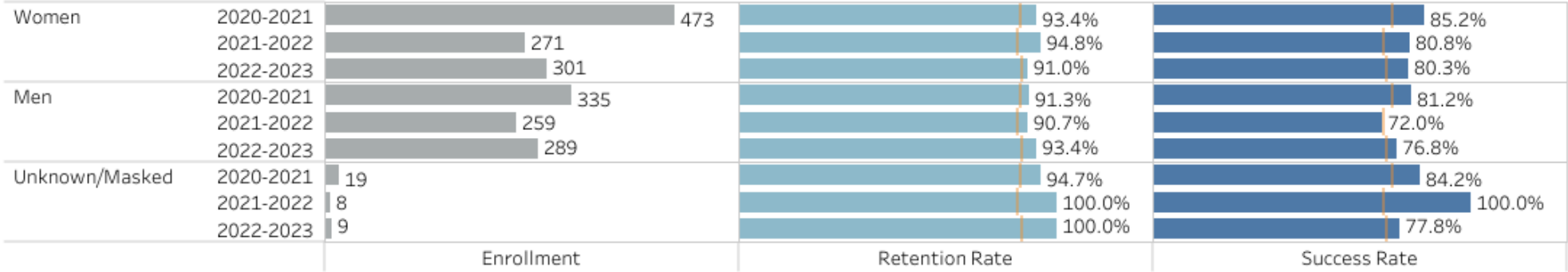
Overall Enrollments, # of Sections, Retention and Success by Year for GEOG



Enrollments, Retention & Success for GEOG by Ethnicity



Enrollment, Retention and Success for GEOG by Gender



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Success and Retention

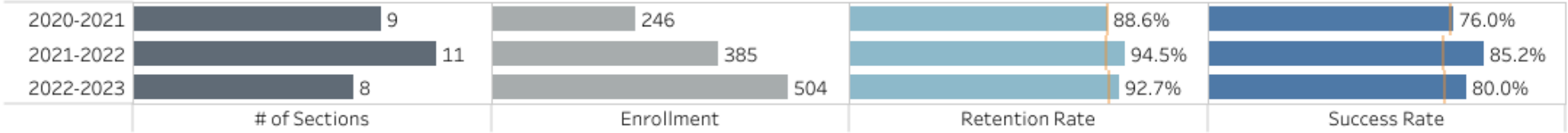
Select Academic Year: Multiple values

Select Subject: GEOL

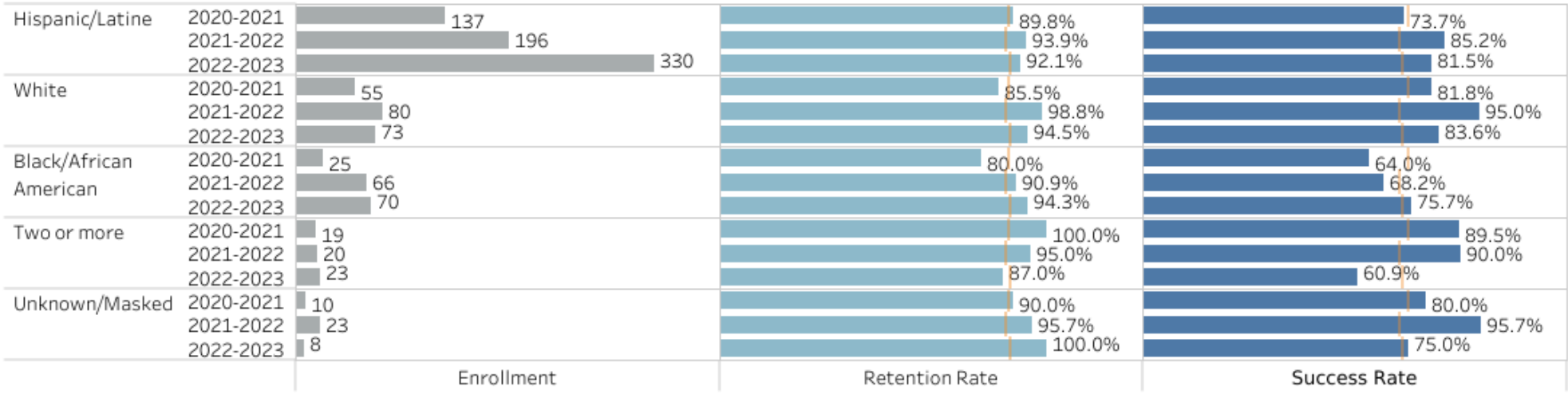
< Select subject here

AVC Retention and Success shown in vertical |

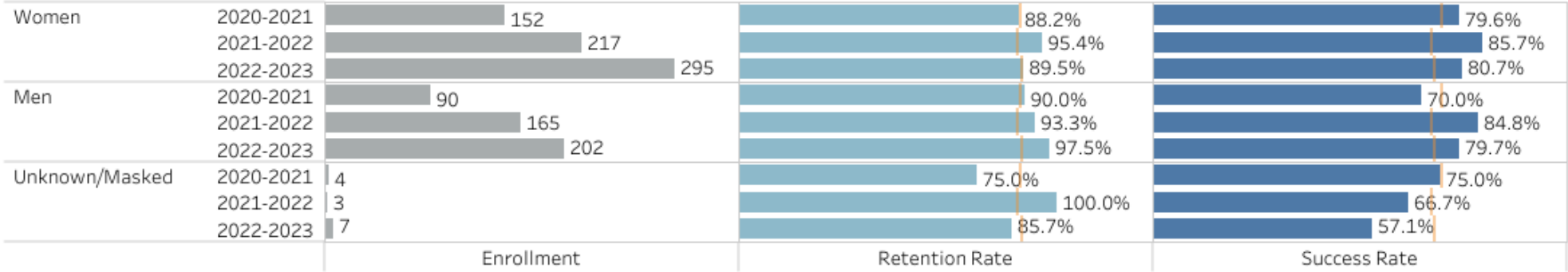
Overall Enrollments, # of Sections, Retention and Success by Year for GEOL



Enrollments, Retention & Success for GEOL by Ethnicity



Enrollment, Retention and Success for GEOL by Gender



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Success and Retention

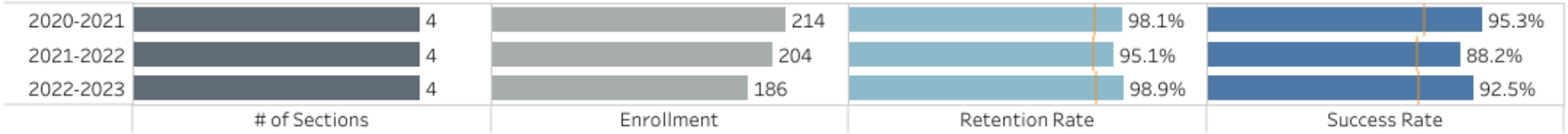
Select Academic Year: Multiple values

Select Subject: ERSC

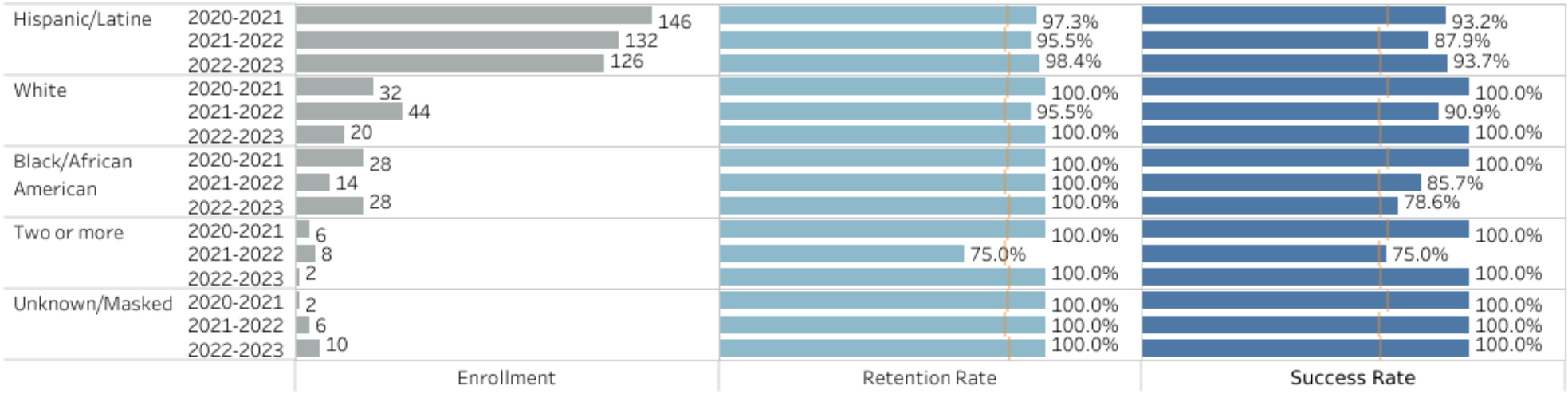
< Select subject here

AVC Retention and Success shown in vertical |

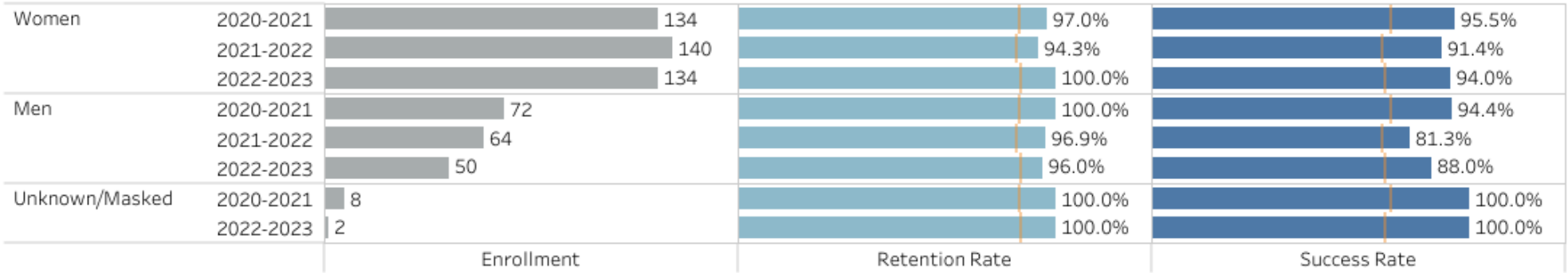
Overall Enrollments, # of Sections, Retention and Success by Year for ERSC



Enrollments, Retention & Success for ERSC by Ethnicity



Enrollment, Retention and Success for ERSC by Gender



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Program Awards

Select Academic Year: Multiple values

Select Ethnicity: All

Gender All

(Use these filters add years & disaggregate by ethnicity and gender for both of the visualizations below)

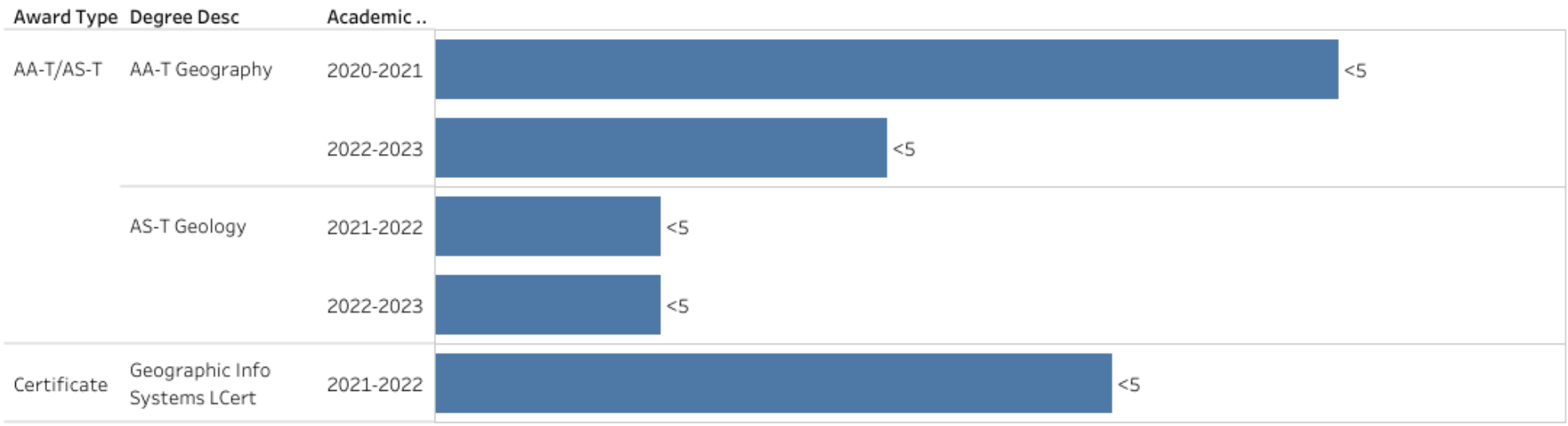
Institutional Awards

Award Type	2020-2021	2021-2022	2022-2023
AA-T/AS-T	790	860	734
AA/AS	1184	1366	1172
Certificate	1223	1426	1115
AVC Local Certificate	159	189	210
Bachelor's	16	13	16
Non-Credit	82	58	38
Grand Total	**3454**	**3912**	**3285**

Select Program Majors: Multiple values

< Select Program Major for the chart below

Subject Awards for AA-T Geography, AS-T Geology, Geographic Info Systems LCert



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Below are the FTEF values for GEOG, GEOL, and ERSC, which sum to 3.13 FTEF as of Fall 2023. There are two adjuncts available to teach in GEOG, one of whom can also teach ERSC and GEOL, but both are only available for online classes. Both full-time instructors also carry reassigned time outside of ERSC/GEOG/GEOL.

Note that GEOG has lost FTEF every fall since 2020 due to inability to hire adjunct instructors leading to course cancellations. GEOL has also lost courses due to inability to hire adjunct instructors.

FTEF

Select subject:
GEOG

FTEF

	Fall 2020	Fall 2021	Fall 2022	Fall 2023
PT (Adjunct) FTEF	1.07	0.77	0.57	0.63
FT (Full-time) FTEF	0.60	1.00	1.00	0.20
FT (Overload) FTEF	0.60			0.60
Grand Total	2.27	1.77	1.57	1.43

PT/FT FTEF Ratio

	Fall 2020	Fall 2021	Fall 2022	Fall 2023
PT/FT FTEF Ratio	1	1	1	1

Full-Time Equivalent Faculty (FTEF) – a faculty member's actual workload standardized against the teaching load (15 LHE). FTEF does not represent an actual number of faculty members; it is a conceptual measure of the workload. FTEF = Contract Workload/15 (Contract teaching load, LHE) (E.g., a 3-Unit Class = 0.2 FTEF)

FTES, FTES/FTEF, and WSCH are unavailable in this dashboard. If this information is needed, please request access to Precision Campus via research@avc.edu.

FTEF

Select subject:
GEOL

FTEF

	Fall 2020	Fall 2021	Fall 2022	Fall 2023
FT (Full-time) FTEF	0.57	0.73	0.17	0.50
FT (Overload) FTEF	0.33		0.40	0.40
Grand Total	0.90	0.73	0.57	0.90

PT/FT FTEF Ratio

	Fall 2020	Fall 2021	Fall 2022	Fall 2023
PT/FT FTEF Ratio	1	1	1	1

FTEF

Select subject:
ERSC

FTEF

	Fall 2020	Fall 2021	Fall 2022	Fall 2023
PT (Adjunct) FTEF		0.40		
FT (Full-time) FTEF	0.80	0.40	0.80	0.80
Grand Total	0.80	0.80	0.80	0.80

PT/FT FTEF Ratio

	Fall 2020	Fall 2021	Fall 2022	Fall 2023
PT/FT FTEF Ratio	1	1	1	1

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.”

Fall 2024 Program Review Report | Instructional Areas

Division/Area Name: MSE/Mathematics	**For Planning Years: 2025-2026**
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 *Success & Retention* and *Program Award* tabs to inform your analysis)

- What are the success and retention rates 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 *Success & Retention* tab including S&R by Ethnicity and Gender data to inform your analysis)

- Which ethnic / gender student groups complete their courses at the highest rates?
- Which ethnic / gender 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 Math Department continues to be united in providing quality instruction while holding a high standard of rigor across all courses. Proof of this comes in the data, which shows that retention and success rates are trending up for almost all types of students. 23-34 overall retention and success were at three-year highs of 82.6% and 64.0%, respectively. Since we also enrolled a higher number of students in 23-24 (6,636) than in 21-22, or 22-23, this means more students were retained and succeeded in a math course than at any other time in the past three years. Similar improvement can be seen for all ethnic and gender categories, except for African American students and students whose gender was unknown or masked, who both had an essentially flat trend in retention in success since 21-22.

Legislation continues to shape the matriculation of students. AB705 led us to incorporate corequisite support classes for our entry level STEM and non-STEM courses, and these have been a success, overall. In response to AB 1705, we have created a corequisite support course for Math 150 (Calculus I) and a Math 149 (Foundations of Calculus) and an associated corequisite support course, all for implementation in Fall 2025. Finally, we have reworked the Math 115 (Statistics) COR to fit the requirements of AB 1111 and the Common Course Numbering project.

Our “math chat” faculty group meets regularly to discuss topics in various courses, including the use of artificial intelligence in math courses and the appropriate and effective use of online education in math courses.

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

The Math Department continues to experience challenges from the aftereffects of AB705, its reinterpretation, and the shift to online in response to the pandemic. In addition, the implementation of AB 1705 is now adding new challenges, especially in the Calculus pathway.

The removal of all prerequisite basic skills courses has led to the first college math class being at the transfer level. Though this has been less impactful in the non-STEM pathway, we continue to see a growing number of students identifying as STEM majors being greatly underprepared for the rigors of our entry level STEM math courses. This issue is compounded by learning loss during the pandemic, especially acute in mathematics, and we are seeing it in the department's declining success rates. Now, in response to AB 1705, we will stop teaching Math 135 (except for one section devoted to AMFT majors) and Math 140.

Despite the increase in retention and success noted above, the overall success and retention rates for Mathematics remain below the average success and retention rates for AVC. And, while the department does see gaps by ethnicity and gender, our success and retention rates for all demographic categories are consistently around 10 percentage points less than AVC's rates, which suggests that the gaps we experience are consistent with the gaps for AVC.

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

The Math Department is working to make the best of the situation in which we find ourselves. We are creating a series of materials and a Canvas shell for Math 150 and Math 150 w/support, to better align the student experience and outcomes for these classes in the face of a new batch of students that will probably be less prepared than we have ever seen at that level. We are developing similar materials for Math 149 w/support. We are leveraging best practices from other colleges, as well as educational research to help give our students the best chance of success.

The biggest hurdle to achieving this goal is that the support systems enacted are new to AVC and up to this point have been 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.

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

☒ N/A

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** (CIPs) 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

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
Provide students with the necessary extra assistance during class time.	Corequisite support has been added for some classes, but not all that could need it. More work still needs to be done.
Increase the opportunities for professional development specifically targeted at disproportionately affected subgroups.	Math Chat Group has discussed numerous strategies for decreasing equity gaps. More work still needs to be done.

Part 3: Based on Part 2 above, please list program/area goals:

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	1,2			Goal #3 Resources: Increase student awareness about campus resources.	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	1,2			Goal #4 Vision: Being more future-thinking, agile, innovative, and proactive.	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.
#3	ILO 2. Creative, Critical, and Analytical Thinking	1,2			Goal #6 Success: Boost success rates by prioritizing the student experience.	Provide students with an appropriate learning environment that includes the necessary workspaces and technology to help make the transition to Calculus under the provisions of AB1705.	1. Design a curriculum to fully implement the desired teaching modality. 2. Create a culture of active learning that promotes student engagement.	1. Increased student engagement and success.
#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
Supplies	Markers, erasers, paper	3	Repeat	TBD	Recurring	Josh Strong
Physical/Facilities	Dedicated classroom space with 360 boards	3	New	TBD	One-time	James Dorn
Physical/Facilities	Smart boards	3	New	TBD	One-time	Josh Strong
Choose an item.			Choose an item.		Choose an item.	
Choose an item.			Choose an item.		Choose an item.	

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

Required:

- Success & Retention tab
- Program Awards tab

Optional:

- Other supporting data/information

Success and Retention

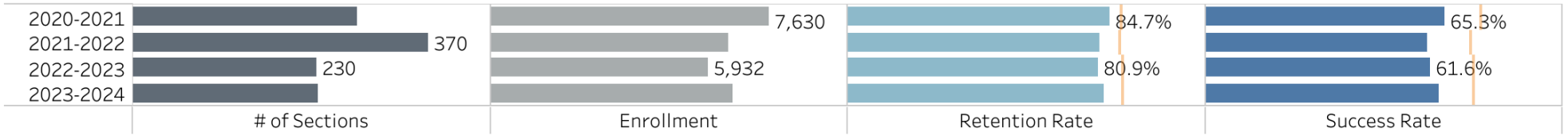
Select Academic Year: Multiple values

Select Subject: MATH

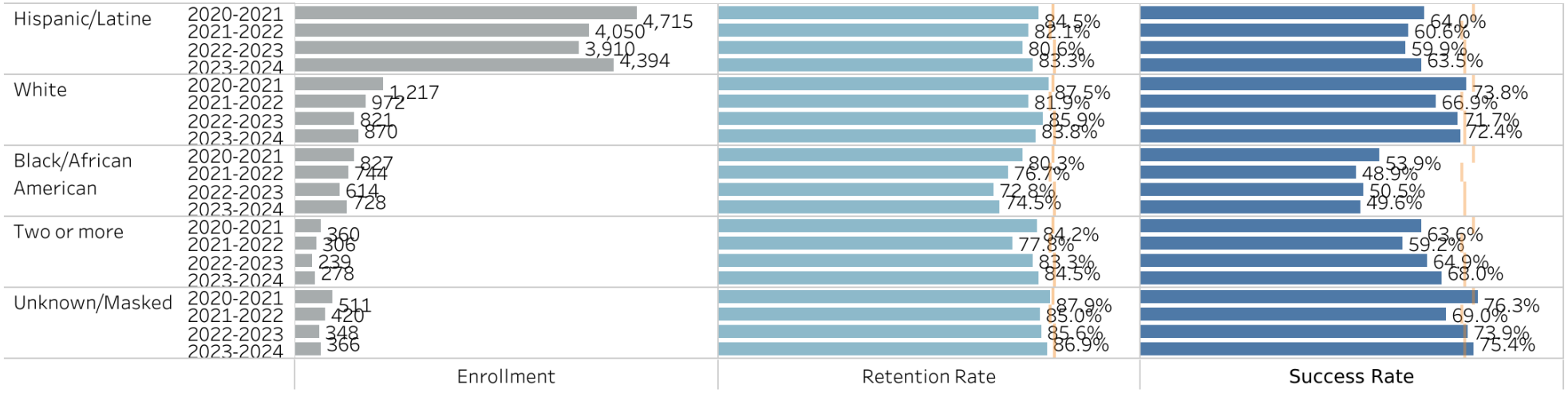
< Select subject here

AVC Retention and Success shown in vertical |

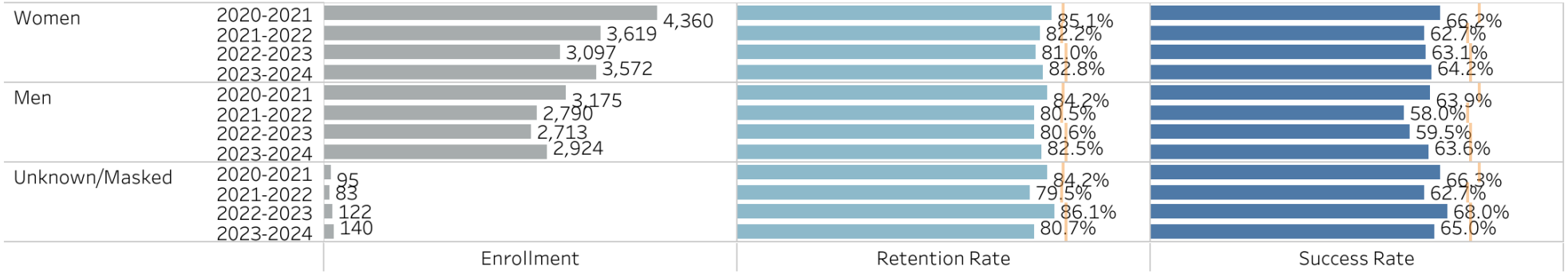
Overall Enrollments, # of Sections, Retention and Success by Year for MATH



Enrollments, Retention & Success for MATH by Ethnicity



Enrollment, Retention and Success for MATH by Gender



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Program Awards

Select Academic Year: Multiple values

Select Ethnicity: All

Gender: All

(Use these filters add years & disaggregate by ethnicity and gender for both of the visualizations below)

Institutional Awards

Award Type	2021-2022	2022-2023	2023-2024
AA-T/AS-T	860	734	640
AA/AS	1366	1172	1292
Certificate	1426	1115	1108
AVC Local Certificate	189	210	194
Bachelor's	13	16	21
Non-Credit	58	38	64
Grand Total	**3912**	**3285**	**3319**

Select Program Majors: Multiple values

< Select Program Major for the chart below

Subject Awards for AS-T Mathematics & LAS: Math and Sciences

Award Type	Degree Desc	Academic ..	
AA-T/AS-T	AS-T Mathematics	2021-2022	38
		2022-2023	38
		2023-2024	41
AA/AS	LAS: Math and Sciences	2021-2022	187
		2022-2023	175
		2023-2024	182

< Click to go back

Click to go next >

Division/Area Name: Mathematics, Sciences & Engineering / Physical Science (PSCI)	For Planning Years: 2025-2026
Name of person leading this review: Mark McGovern	
Names of all participants in this review: 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 *Success & Retention* and *Program Award* tabs to inform your analysis)

- What are the success and retention rates 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 *Success & Retention* tab including S&R by Ethnicity and Gender data to inform your analysis)

- Which ethnic / gender student groups complete their courses at the highest rates?
- Which ethnic / gender 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 S*trengths 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 2020-21 to 2023-24 have remained high (>91%). Success rates initially increased over the same four-year period, peaked in 2022-2023, but have dipped below 90% this past academic year. Regardless, the program has remained well above the college average retention and success rates. There are currently no physics science programs; however, students can take PSCI courses to satisfy the requirements for a Liberal Arts: Math and Science degree. The rates of completion for both degrees have remained steady over the past few years.

Regarding gender equity data for men, success and retention rates have increased (> 90%) from previous years and are well above the college average. Regarding race/ethnicity equity data, the majority of PSCI students are categorized as 'Hispanic/Latine' and their retention (96%) and success (89%) rates have remained high and are well above the college average. Rates for 'White' and 'Two or more' categories have also remained high and above the college average.

Enrollment for all courses offered in the program has remained high even though the number of course offerings have decreased.

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 a couple of years ago, but they sadly passed away before the start of last academic year and we have yet to find a replacement. As a result, we had to lower the number of 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.

Regarding gender equity data for women, success (82%) and retention (86%) rates have dropped from previous years. In fact, the retention rate was below the college average for the past academic year. It is challenging to know the source of the difference considering that enrollment has dropped, and we are working with under 30 students. Furthermore, this is only the first year of decline. That is not enough time to state that this is a trend in the data or a simple random variance in the data. Results will be monitored for the next couple of years and if they continue to remain low the discipline will need to take action to increase our numbers in these categories.

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 (50% this past year) for African American/Black groups which sits significantly lower than the college average. Additionally, retention rates have dropped this past academic year below the college average. While the number of students in this data set is low (6), nevertheless the faculty wants to see these rates increase and 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.

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. We would like to see a permanent lab technician at the Palmdale campus so that we can properly support instruction there. 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

☒ N/A

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 Education, General (CIP 131101); Education Teachers, Postsecondary. It is estimated that there are approximately 2,190 job openings annually in Los Angeles County. The labor market data related to the physical science curriculum of PSCI 302 falls under two categories (TOP code 1930.00): Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary; and Geoscientists, Except Hydrologists and Geographers. It is estimated that there are approximately 370 and 480 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** (CIPs) and progress toward meeting those plans.

PSCI 101 Maintaining High Achievements - The performance on SLO 1 and SLO 2 was target met or exceeded with a 90% rate for both. We will continue to monitor the performance and make sure we have enough instructional support and modern laboratory equipment to maintain these results.	A couple of years ago, 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 Maintaining High Achievements - Only one year of data is available to analyze, which is not enough time to witness any significant trends. Faculty will review the current assessment tool and make changes as needed to ensure proper assessments of student learning are occurring.	While the results from the past academic year were excellent, there has been only one year of data to look at which is not enough time to document trends. A couple more years of data collection with the current assessment tool will need to occur before any proper conclusion can be drawn.

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 – Increase offerings	Due to the lack of full-time faculty in the discipline and the sparse number of adjunct faculty available to teach sections, the division has not been able to increase enrollment. A job announcement was made recently and a pool of candidates for a full-time position has been formed. At the time of writing, interviews for a full-time candidate are underway.

#2 – Full time Instructor	A job announcement for a full-time faculty member was made recently and a pool of candidates has been formed. At the time of writing, interviews for a full-time candidate are underway.
#3 – Laboratory Quality	For this goal, we were looking to improve the quality of activities used for instruction. Adjunct faculty in the discipline were consulted and in combination with SLO data from PSCI 101 several changes were made to the material and additional equipment was obtained to enhance current activities. Future SLO data will reveal if these changes were successful.

Part 3: Based on Part 2 above, please list program/area goals:								
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 course offerings	ILO 1. Communication				Goal #5 Education: Expansion of offerings and effective course scheduling.	Increase the number of sections of PSCI 101 offered at both the Lancaster and Palmdale campuses to increase student enrollment.	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. This will be achieved by the successful hire of a full-time faculty member in physical science and potentially additional adjunct faculty members.
#2 – Improve the quality of laboratory equipment and activities	ILO 2. Creative, Critical, and Analytical Thinking		ALL		Goal #6 Success: Boost success rates by prioritizing the student experience.	Improve the quality of laboratory equipment used in the activities used to teach physical science to improve the educational experience of students.	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 will look to see that SLOs targets remain at their current high level or even improve.

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 and additional adjunct faculty as needed	#1	Repeat	$65,000 – 100,000	One-time	Jedidiah Lobos (Dean), Alexandra Schroer (Chair)
Physical/Facilities	Have room darkening window blinds installed in PSCI room UH239	#2	Repeat	$10,000-30,000	One-time	Jedidiah Lobos (Dean), Alexandra Schroer (Chair)
Supplies	On-going budget to upgrade, replace, and acquire new equipment for the labs and demonstrations.	#2	Repeat	$10,000	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.	#2	Repeat	$15,000	Recurring	Jedidiah Lobos (Dean), Alexandra Schroer (Chair)

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

Required:

- Success & Retention tab
- Program Awards tab

Optional:

- Other supporting data/information

Success and Retention

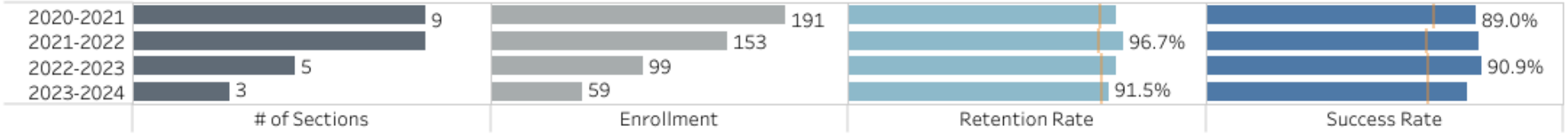
Select Academic Year: Multiple values

Select Subject: PSCI

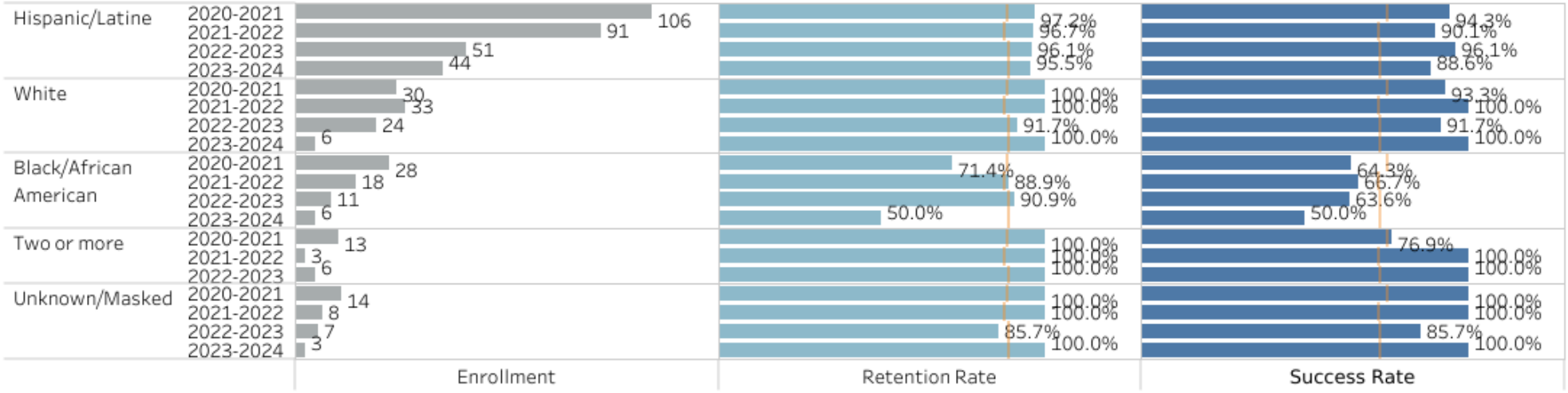
< Select subject here

AVC Retention and Success shown in vertical |

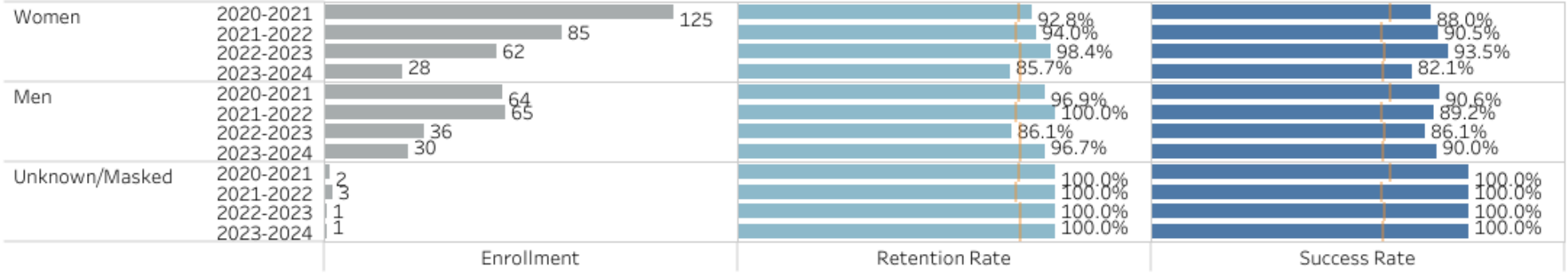
Overall Enrollments, # of Sections, Retention and Success by Year for PSCI



Enrollments, Retention & Success for PSCI by Ethnicity



Enrollment, Retention and Success for PSCI by Gender



Program Awards

Select Academic Year: Multiple values

Select Ethnicity: All

Gender All

(Use these filters add years & disaggregate by ethnicity and gender for both of the visualizations below)

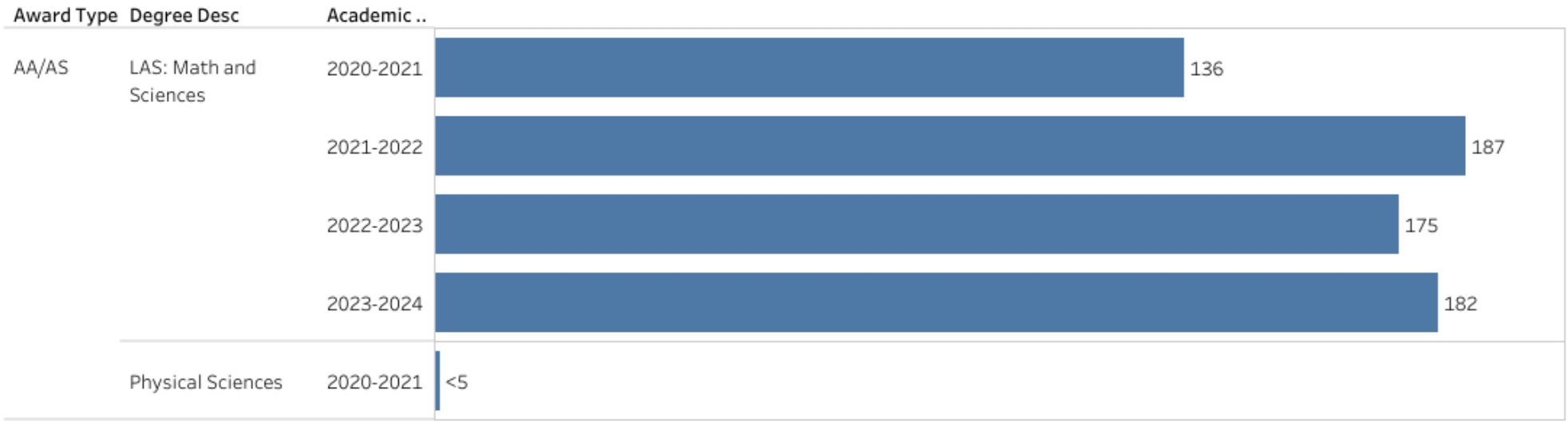
Institutional Awards

Award Type	2020-2021	2021-2022	2022-2023	2023-2024
AA-T/AS-T	790	860	734	640
AA/AS	1184	1366	1172	1292
Certificate	1223	1426	1115	1108
AVC Local Certificate	159	189	210	194
Bachelor's	16	13	16	21
Non-Credit	82	58	38	64
Grand Total	**3454**	**3912**	**3285**	**3319**

Select Program Majors: Multiple values

< Select Program Major for the chart below

Subject Awards for LAS: Math and Sciences & Physical Sciences



Fall 2024 Program Review Report | Instructional Areas

Division/Area Name: Mathematics, Sciences & Engineering / Physics (PHYS)	**For Planning Years: 2025-2026**
Name of person leading this review: Dr Chrysanthos Kyriakides	
Names of all participants in this review: Dr Jason Bowen Dr Mark McGovern	

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, Puente mentoring, and program participation in the future joint AVC/California State University Bakersfield AV Engineering Program. Physics also participates in AVC's Baccalaureate Degree Program of Airframe Technology. Students who completed physics courses have successfully transferred to UCs, CSUs, and other four-year universities, seeking degrees in engineering, physics, biology, kinesiology, optometry, radiology technicians, and other related fields

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 *Success & Retention* and *Program Award* tabs to inform your analysis)

- What are the success and retention rates 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 *Success & Retention* tab including S&R by Ethnicity and Gender data to inform your analysis)

- Which ethnic / gender student groups complete their courses at the highest rates?
- Which ethnic / gender 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. It now stands at 81.2%, an increase over the prior cycle of 79.2%. The overall retention rate is marginally lower than the college average, 88.1% and 89% respectfully, it has improved by nearly three percentage points over the last cycle. The retention rate for female students increased by more than five points to 88.9%, while the success rate for female students increased by nearly four points to 82.5%, a marked increase in both fields. Male students remained virtually unchanged with less than a point decrease in both retention and success rates or 87.1% and 79.8%, respectively. Retention rates for male students are lower than the college averages, female students are virtually at the college average, 88.9 vs 89%. Success rates, however, for both demographics exceed the college average. Hispanic/Latinx saw increases in both retention and success rates. While white saw a drop in both retention and success rates when compared to the previous cycle. With the success rate for white non-Hispanic student remaining above college average. A remarkable improvement for African American students with the retention rate increasing to 90%, an increase of twenty-one points, and the group's success rate at 75%, an increase of thirteen points compared to the last cycle. Succes rates for all demographics exceed the college averages. Retention rates are only exceeded by African American students, while White non-Hispanic and Hispanic/Latinx retention rates are 0.4 and 3.1 points below the college average respectively

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

The overall retention rate is now marginally lower than the college average, 88.1 vs 89%. It has improved by two percentage points over the previous cycle. An opportunity exists to increase total retention rates. Total enrollment has increased and is the highest in this three-year period at 938. The total number of sections offered in the 2023-2024 academic year has increased from 20 sections to 21 sections. The retention and success rates for male students remain flat at 79.8 and 87.1%, respectively. Retention rates for Hispanic/Latinx, female students have increased by three and five points respectively. While Hispanic/Latinx students remain lower than the college average, female students have achieved parity at barely 0.1% below the average. Hispanic/Latinx retention rates also remain below the college average. African/American and students with two or more races have retention rates above the college average at 90. 0% and 92.3% respectively. The success rate exceeds the college average across genders and ethnicities. The most remarkable success rate was the reversal of below college average success rate by the African/American students. The group's success rate increased by thirteen points to 75%. We are hoping the 62.5% success rate from the previous year is an outlier. Only time and data will reveal whether that is the case. We will continue to monitor the success rates. It should be noted that the African/American student success rate while significantly increased and above the college average, remains below the success rate for Hispanic/Latinx students by four points and white non-Hispanic by ten points 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. The unknown or masked gender population, while it had an impressive performance ,100% in both rates, remains small for any conclusions to be drawn

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 upcoming joint CSUB/AVC Engineering Program. Support the MESA program, Puente mentor program 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

☐ N/A

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

For the fall 2023, spring 2024, the SLOs 1,2 were 92.7%, 76.5% for physics 101; 100%, 100% for physics 102; 79.3%,66.5%, for physics 110; 74%. 58.7%, for physics 120; and 66.7%. 72.7% for physics 211. Apart from marginal failure, 66.7%. physics 211, all SLO 1, numerical applications, met or exceeded the stated goal of 70%. For SLOs 2 , conceptual understanding, the goal of 70% were met in physics 101,102, and 211. The goal was marginally not met for physics 110, and 120. Regrettably the equipment requested through the CIP was not acquired until late summer of 2024. Its impact will not be measured until the fall of 2024.

Past Course Improvement Plans	Progress Made
Expanding use of clickers to access student understanding in real-time	Substantial increase in PHYS 101 performance in both categories
Acquiring reliable wireless lab equipment, streamlining labs	The equipment was not acquired until the summer of 2024. Its impact will not be measured until the fall of 2024
Building purchasing new real-life/virtual demonstrations in class	The new demonstrations have generated interest, enthusiasm and engagement with students. Demos have also improved conceptual understanding
Emphasis on active learning, student grouping during in-class worksheets	The SLOs shown a steady or improving status

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

In the 2022-2023 academic year the retention and success rates were 85.7% and 79.2%. In the year examined here, the 2023-2024 academic year, the retention and success rates increased to 88.1% and 81.2% respectively. Retention and success rates have not been restored to pre-pandemic levels in the current program review cycle, however, they are moving in the right direction. We are hopeful and note that the 2023-2024 academic year is two years 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 20 to 18, however, enrollment has gone up, from 884 the previous year to 938 in 2023-2024. This has to do with the fact that physics supports several other AA-T, AS-T and Baccalaureate degrees, including but not limited to, engineering, mathematics, chemistry, airframe manufacturing, kinesiology, biology, radiology technician etc. Improving enrollments and maintaining this trend, may have a positive impact on our program goals.

Past Goal	Progress Made
Increase student retention rates to pre-pandemic levels	Rates have improved by 3 points to 88.1%. Marginally below reference line of 89%
Increase student success rate	Rates improved by 2 points to 81.2%, well above ref. line of 73%
Increase AS-T degrees to pre-pandemic levels	Declined from 20 to 18

Part 3: Based on Part 2 above, please list program/area goals:								
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 1. Communication				Goal #3 Resources: Increase student awareness about campus resources.	Increase student retention and success rates	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 resources. (4) Encourage students to voice their opinion anonymously via clickers or other methods	Review Program Review data
#2	ILO 2. Creative, Critical, and Analytical Thinking				Goal #1 Service: Realign college policies, practices, and processes to remove barriers and to become more effective, efficient, and responsive to students, employees, and the community.	Increase student retention and success rates	(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 problems presented in class, meeting with a tutor in the learning center, seeing the instructor regularly during office hours to review the material, etc.	Review program review data

#3	ILO 4. Career and Specialized Knowledge				Goal #5 Education: Expansion of offerings and effective course scheduling.	Increase the number of AS-T degrees, sections offered, to pre-pandemic levels	increase retention and success rates, and enrollments	Review program review data
#4	ILO 3. Community /Global Consciousn ess				Goal #6 Success: Boost success rates by prioritizing the student experience.	Increase enrollment and sections offered	Promote upcoming joint AVC/CSUB 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	Full time faculty	Area goal #2, 3,4	Repeat	$125,000	Recurring	Dr. Chrysanthos Kyriakides
Faculty	Adjunct faculty	2,3,4	Repeat	$80,000	Recurring	Dr. Chrysanthos Kyriakides
Technology	Lab equipment, demonstrations	1,2,3,4	New	$15,000	One-time	Dr Chrysanthos Kyriakides
Other	Stipend for outreach	1,2,3,4	Repeat	$10,000	Recurring	Dr Chrysanthos Kyriakides
Professional development	Funding for travel to conferences	2	Repeat	$15,000	Recurring	Dr Chrysanthos Kyriakides

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

Required:

- Success & Retention tab
- Program Awards tab

Optional:

- Other supporting data/information

Success and Retention

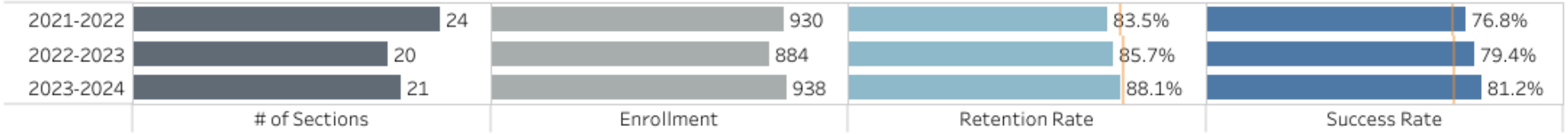
Select Academic Year: Multiple values

Select Subject: PHYS

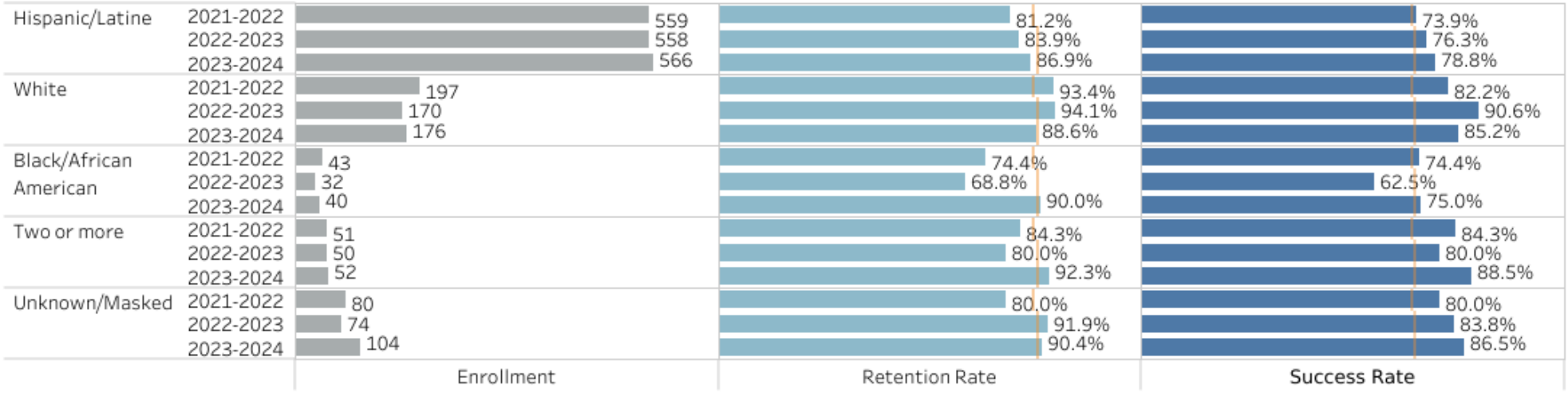
< Select subject here

AVC Retention and Success shown in vertical |

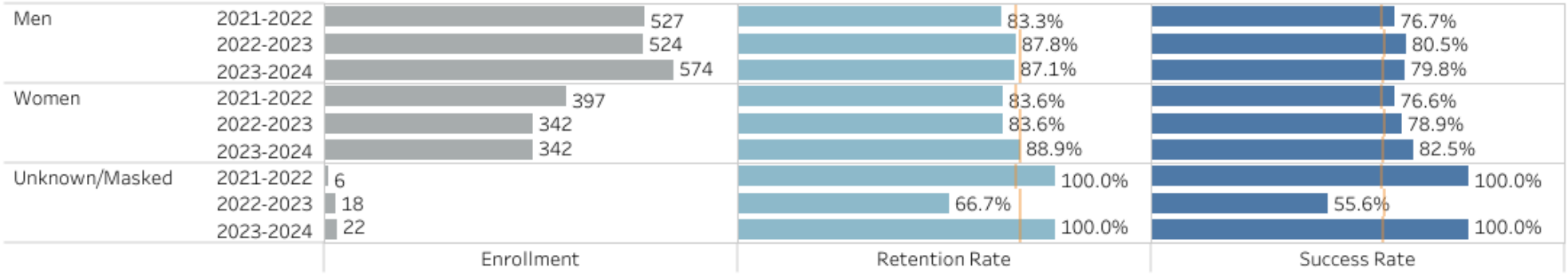
Overall Enrollments, # of Sections, Retention and Success by Year for PHYS



Enrollments, Retention & Success for PHYS by Ethnicity



Enrollment, Retention and Success for PHYS by Gender



< Click to go back

Click to go next >

Program Awards

Select Academic Year: Multiple values

Select Ethnicity: All

Gender All

(Use these filters add years & disaggregate by ethnicity and gender for both of the visualizations below)

Institutional Awards

Award Type	2021-2022	2022-2023	2023-2024
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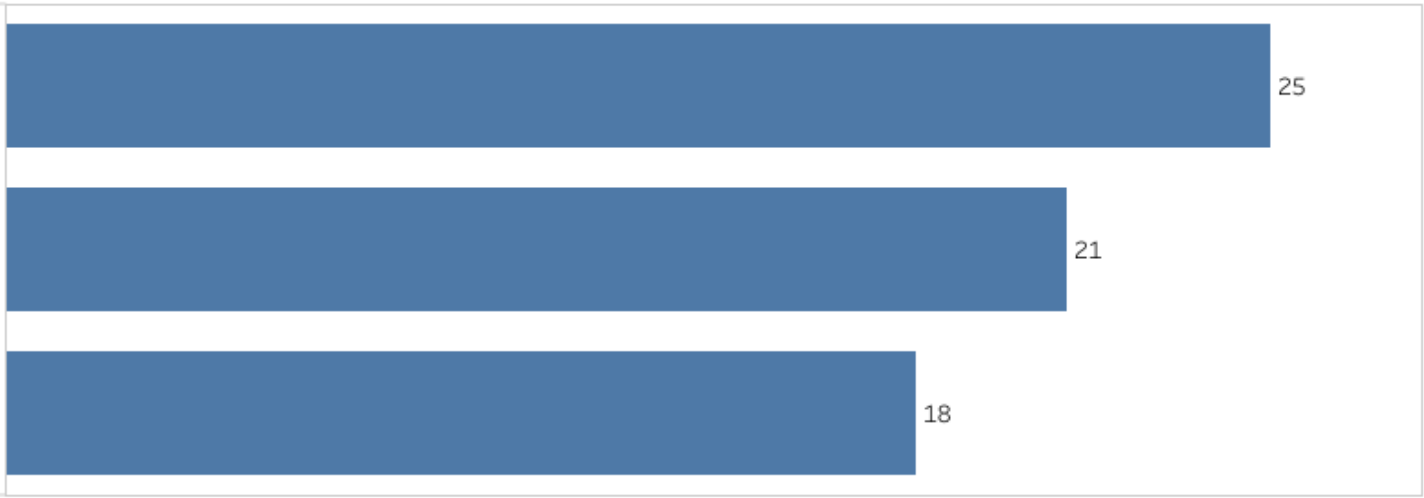
Certificate	1426	1115	1108
AVC Local Certificate	189	210	194
Bachelor's	13	16	21
Non-Credit	58	38	64
Grand Total	**3912**	**3285**	**3319**

Select Program Majors: AS-T Physics

< Select Program Major for the chart below

Subject Awards for AS-T Physics

Award Type	Degree Desc	Academic ..
AA-T/AS-T	AS-T Physics	2021-2022
		2022-2023
		2023-2024



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