2020-2021 Program Review Report

Division/Area Name: MSE Division--Agriculture: Park and Landscape Management	For Years: 2022-2023
Name of person leading this review: Christos Valiotis	
Names of all participants in this review: Christos Valiotis, Sharon Weisenberger, Denise Keef, Heather Kock	

Part 1. Program Overview:

Due to low enrollment the program is scheduled for discontinuance starting in Spring 2022. Currently we are preparing a two-semester schedule so that all students on track to earn a degree or certificate can do complete them.

Division/Area Name: Mathematics, Science, & Engineering / Astronomy	For Planning Years: 2022-2023
Name of person leading this review: Mark McGovern	
Names of all participants in this review: Mark McGovern	

Part 1. Program Overview:

1.1.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.
1.2.State briefly program highlights and accomplishments
The astronomy discipline contains only two classes, lecture and lab. In the lecture (ASTR 101), due to the transition to fully online instruction because of the pandemic, the use of online tools such as Canvas and online simulations has been greatly expanded. This had allowed students to

become more hands-on during lecture. This has also resulted in a very robust online instruction system that is continuing to be utilized for hybrid instruction and to further develop the already existing online astronomy course. Regarding the lab (ASTR 101L), for similar reasons, the amount of content in the course has greatly expanded. The discipline has expanded its lab activities to incorporate more online simulation resources and, in the process, a formal lab manual is being written to organize activities, which last year was put on hold.

***1.3. Check each** Institutional Learning Outcome (ILO) **supported by the program.** Type an "X" if checkbox is unavailable.*

X **Communication**	X Demonstrates analytical reading and writing skills including research, quantitative and qualitative evaluation and synthesis. ☐ Demonstrates listening and speaking skills that result in focused and coherent communications
X **Creative, Critical, and Analytical Thinking**	X Uses intellectual curiosity, judgment and analytical decision-making in the acquisition, integration and application of knowledge and skills. X Solves problems utilizing technology, quantitative and qualitative information and mathematical concepts.
X **Community/Global Consciousness**	X Understands and applies personal concepts of integrity, ethics, self-esteem, lifelong learning, while contributing to the well-being of society and the environment. ☐ Demonstrates an awareness and respect of the values of diversity, complexity, aesthetics and varied cultural expressions.
X **Career and Specialized Knowledge**	X Demonstrates knowledge, skills and abilities related to student educational goals, including career, transfer and personal enrichment.

***1.4. Check each** Educational Master Plan (EMP)/Strategic Plan Goal **supported by the program.** Type an "X" if checkbox is unavailable.*

☐ **Goal 1:** Commitment to strengthening institutional effectiveness measures and practices.
X **Goal 2:** Increase efficient and effective use of resources: Technology; Facilities; Human Resources; Business Services.
X **Goal 3:** Focus on utilizing proven instructional strategies that will foster transferable intellectual skills.
☐ **Goal 4:** Advance more students to college-level coursework-Develop and implement effective placement tools.
☐ **Goal 5:** Align instructional programs to the skills identified by the labor market.

Part 2.A. Please provide the results of any internal and external environmental scan information you have gathered related to the program e.g. surveys, interviews, focus groups, advisory groups, licensure exam scores, job placement, State mandates, etc.:

Astronomy is a non-CTE discipline. As a result of AB 705, the pre-requisite of MATH 102 has been removed from the course so the number of students available to register for the course has increased. We are still adjusting for this change however, the pandemic has made it difficult last year to properly investigate the impact. The discipline is not part of a program, aside from being an elective in the LASM degree, and we do not have any external environmental scans. The main goal of the discipline is to support the general education requirements of our students.

Recently, the discipline switched the textbook to one that is an OER (Open Educational Resource). A survey of student last year showed overwhelming support for the change. There are no other identifiable external factors that appear to be affecting the discipline.

Part 2.B. Analyze the program review data (please see the program review data retrieval instructions and attach your program review data page with any other supporting documents), the above environmental scan information, and anything else related to your area to identify the program strengths, weaknesses, opportunities, & threats (SWOT):

Strengths	Both lecture and lab course utilize OER (Open Education Resources) which reduces the cost of education for students and hopefully makes our courses more accessible for students. Our retention rates are increasing and remain above average with respect to the rest of the college (97% vs. 89%). In 2019-2020, ASTR's success rate increased again to 91.3% vs. AVC's rate of 74.8%. Regarding gender & race/ethnicity, the discipline across the board has retention and success rated above the numbers for the college overall.
Weaknesses	There have been some scheduling issues with the Virtual Science Lab (VSL) that has not allowed lecture courses to fully utilize the resources there. We lack adjunct faculty in this discipline to support current and any additional sections of lecture in the future.
Opportunities	Prior to the pandemic, the discipline had started to create a relationship with local K-12 schools to bring them to the VSL for educational shows to promote both AVC and science education in general. The hope is that a lasting impact is made with many of these younger students to encourage them to pursue STEM-related fields and, in particular, to show them the opportunities that exist at AVC.
Threats	The COVID-19 pandemic has prevented the use of the VSL to support instruction and community outreach. The lack of adjunct faculty threatens the growth of the discipline.

Part 2.C. Review and comment on progress towards SLO/PLO/OO Outcomes Analysis (fka Action Plans):

For ASTR 101, the discipline experienced a modest increase in success rates that could be attributed to the increase in simulations and data modeling that was introduced to instruction due to the online nature of classes because of the COVID-19 pandemic. This was partially implemented as an action from the previous year's outcome analysis. To address the continued low overall percentages of students meeting expectations, it would be wise to re-evaluate the assessment tool to better reflect the ever-changing methods of instruction being utilized. With all that being said, it is difficult to properly determine the observed changes in the data since the last year of instruction was been unprecedented due to the COVID-19 pandemic. Faculty will continue to explore different methods of delivering challenging content to students to improve student success. Additionally, assessments need to be re-evaluated to better assess learning with the introduction of newer instructional methods.

For ASTR 101L, faculty will continue to offer the same laboratory instruction that occurred pre-pandemic. The outcome analysis from last year will be implemented again, namely to have faculty revise lab activities to include a more robust review of relevant mathematical topics as part of each lab activity that includes them. This is to address the mathematical challenges that many students are currently facing and will continue to face in light of AB 705.

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

The previous year's planning was dominated by the switch to fully online instruction. However, this challenge allowed for greater use of online tools, such as interactive 3D visualizations and simulations, to help students better visualize the content of the course. At this time, much of that work is now being integrated into the lecture and lab courses.

Part 3. Based on Part 2 above, please list program/area goals for 2021-2022:

Program/Area Goal #	***Goal supports which ILO/PLO/SLO/OO?***	***Description of Goal***	***Steps to be taken to achieve goal?***
#1 VSL Training	ILO #2; EMP #2, 3; ASTR 101 SLO #1	To improve the methods of instruction for both lecture and lab courses, faculty will receive additional training on the use of the Virtual Science lab equipment to	Faculty can attend training conferences established by the manufacturers of the VSL equipment (E&S) on their effective use for instruction. Additionally, there are many online training materials that can be studied.
#2 VSL Software	ILO #2; EMP #2; ASTR 101 SLO #1	To improve amount of content available for instruction, the discipline should procure new software for the Virtual Science Lab and renew licenses for current software	Contact E&S to upgrade current software, renew licensing agreements, and purchase new software.
#3 Lab Manual	ILO #1,4; ASTR 101L SLO #1, 2	Currently, lab activities have individual descriptions and reports and are disjointed. The creation of a single document should provide coherence across all activities.	Create a lab manual document and provide it to the bookstore for reproduction and use.
#4 Lab Equipment	ILO #1, 2, 4; EMP #2; ASTR 101 SLO #1	To improve student learning as identified in outcome analysis, additional equipment will need to be acquired and introduced into current lab activities. Additionally, some equipment is outdated and should be replace with modern ones.	Identify suitable replacement equipment and purchase them.

#5 Enrollment	EMP #2	To meet current and potential future enrollment demands we must hire a part time instructor. One full time faculty in this area is not sufficient.	Contact human resources to put out a call for a part time instructor.

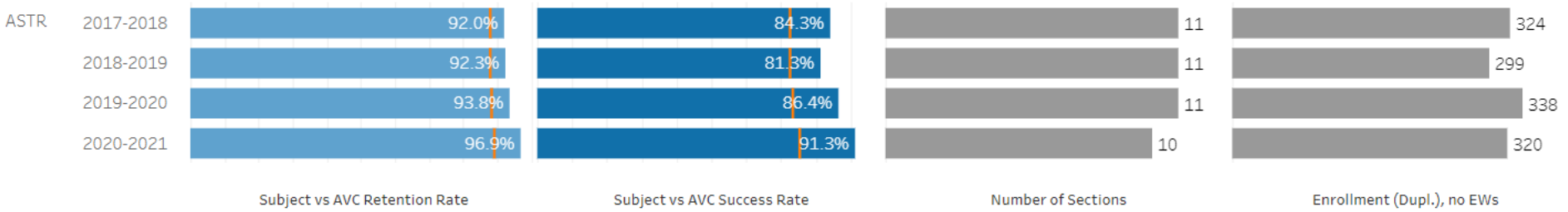
Part 4. Resource Requests that Support Program Needs (Based on above analyses and listed in priority order):

Type of Resource Request	*Summary of Request*	*New or Repeat Request*	*Amount of Request, $*	*One-Time or Recurring Cost, $*	*Contact's Name*
Faculty	Hire one part-time faculty	Repeat	$10,000/year?	Recurring	Mark McGovern, Faculty or Alexandra Schroer, Dept Chair or Christos Valiotis, Dean
Classified Staff	none	--	--	--	--
Technology	Purchase new licenses or renew licenses for VSL Software	Repeat	$20,000	One-time for new software and recurring (every 4 or 5 years) to renew licenses	Mark McGovern, Faculty or Alexandra Schroer, Dept Chair or Christos Valiotis, Dean
Physical/Facilities	none	--	--	--	--
Supplies	Purchase new lab equipment (i.e. telescopes, sky maps, sky simulation software, etc.) to replace currently aging equipment.	Repeat	$5,000 telescopes $1,000 software and other equipment	One-time	Mark McGovern, Faculty or Alexandra Schroer, Dept Chair or Christos Valiotis, Dean
Professional Development	Registration and/or travel to attend conferences and access online material for VSL Training	Repeat	$2,000	One-time	Mark McGovern, Faculty or Alexandra Schroer, Dept Chair or Christos Valiotis, Dean
Other	None	--	--	--	--

****REQUIRED: After gathering the information above, fill out your RESOURCE REQUESTS to be shared with the Budget Committee: https://www.surveymonkey.com/r/20-21ProgramReview**

Part 5. Insert your Program Review Data here, as well as any other supporting data. (See Part 2.B above.)

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



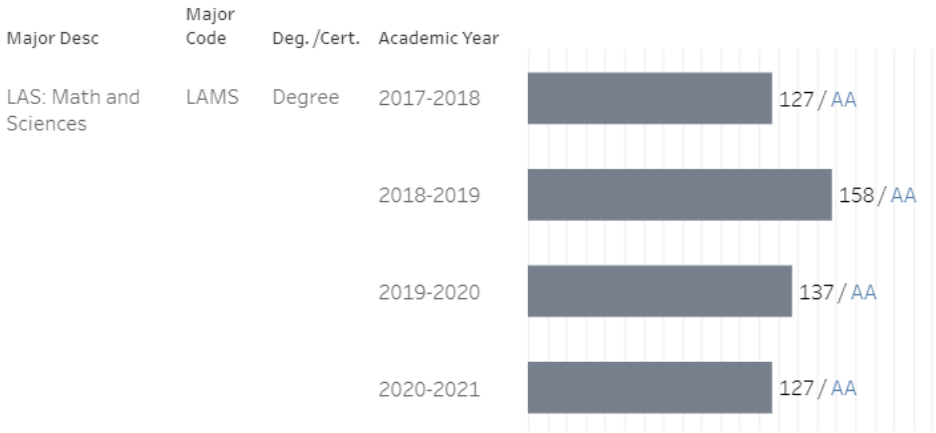
Enrollment and Number of Sections by ***Modality*** in ASTR

	Instr. Method	2017-2018	2018-2019	2019-2020	2020-2021
Number of Sections	Online	1	1	2	2
	Traditional	10	10	9	8
Enrollment	Online	42	39	94	86
	Traditional	282	260	250	234

Enrollment and Number of Sections by ***Location*** in ASTR

	Location	2017-2018	2018-2019	2019-2020	2020-2021
Number of Sections	Lancaster	11	11	11	10
Enrollment	Lancaster	324	299	344	320

Number of Degrees/Certificates Awarded in LAS: Math and Sciences (LAMS)



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

	Fall 2017	Fall 2018	Fall 2019	Fall 2020
FT (Regular) FTEF	0.8	0.8	0.4	0.4
FT (Overload) FTEF	0.2	0.2	0.4	0.4
TOTAL FTEF	1.0	1.0	0.8	0.8
PT/FT FTEF Ratio	0.0	0.0	0.0	0.0
FTES	16.2	14.8	14.4	14.7
FTES/FTEF Ratio	16.8	15.3	18.8	18.4
WSCH/FTEF Ratio	503.1	458.7	565.0	552.8

2020-2021 Program Review Report

Division/Area Name: Mathematics, Sciences & Engineering/ Biological and Environmental Sciences	For Planning Years: 2022-2023
Name of person leading this review: Zia Nisani	
Names of all participants in this review: Bassam Salameh, Patricia Palavecino, Nikki Riley, Lena Coleman, Jedidiah Lobos, Joseph Esdin, Barbara Fredette	

Part 1. Program Overview:

1.1.Briefly describe how the program contributes to the district mission

The district's mission is to provide a quality, comprehensive education to a diverse population of learners. This includes various transfer degrees and Transfer/General Education Courses. The biology program continues to meet these goals and increase course offerings to facilitate transfer courses for the A.S. and A.S-T in Biology. Currently biology is the 4th largest major on campus and in the 2020-2021 cycle and we had 17 (AS-BIOLOGY), 38 (AS-T Biology) & 127 (AS- LA in Math & Sciences) degrees granted. Finally, many of our courses are program prerequisites for the Registered Nursing (RN) and other allied health programs.

1.2.State briefly program highlights and accomplishments

(1) The number of students declaring biology as a major has steadily increased and so has the number of graduates. (2) Most of the labs in majors and non-majors courses are moving to the area of inquiry-based education. (3) Some faculty have actively engaged in scientific research and have mentored undergraduates. This has resulted in students presenting at conferences and publishing papers in peer-reviewed journals.

***1.3. Check each** Institutional Learning Outcome (ILO) **supported by the program.** Type an "X" if checkbox is unavailable.*

☑ **Communication**	☑ Demonstrates analytical reading and writing skills including research, quantitative and qualitative evaluation and synthesis. ☑ Demonstrates listening and speaking skills that result in focused and coherent communications
☑ **Creative, Critical, and Analytical Thinking**	☑ Uses intellectual curiosity, judgment and analytical decision-making in the acquisition, integration and application of knowledge and skills. ☑ Solves problems utilizing technology, quantitative and qualitative information and mathematical concepts.
☑ **Community/Global Consciousness**	☑ Understands and applies personal concepts of integrity, ethics, self-esteem, lifelong learning, while contributing to the well-being of society and the environment. ☑ Demonstrates an awareness and respect of the values of diversity, complexity, aesthetics and varied cultural expressions.

☑**Career and Specialized Knowledge**	☑ Demonstrates knowledge, skills and abilities related to student educational goals, including career, transfer and personal enrichment.

***1.4. Check each** Educational Master Plan (EMP)/Strategic Plan Goal **supported by the program.** Type an "X" if checkbox is unavailable.*

☑ **Goal 1:** Commitment to strengthening institutional effectiveness measures and practices.
☑ **Goal 2:** Increase efficient and effective use of resources: Technology; Facilities; Human Resources; Business Services.
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☐ **Goal 4:** Advance more students to college-level coursework-Develop and implement effective placement tools.
☐ **Goal 5:** Align instructional programs to the skills identified by the labor market.

Part 2.A. Please provide the results of any internal and external environmental scan information you have gathered related to the program e.g. surveys, interviews, focus groups, advisory groups, licensure exam scores, job placement, State mandates, etc.:

Biology degree programs do not have external environmental scans. As for the internal scans, we primarily depend on our PLOs and internal discussions to assess and improve our program.

(1) With our last analysis of PLO 1, "Demonstrate a practical working knowledge of the scientific method, and the ability to collect, evaluate, and analyze scientific data," 77% of the students met or exceeded the target. Our target goal is 90%, however, we believe that because of the online nature of instruction (due to COVID) students did not receive proper guidance and mentoring that normally occurs in face-to-face instruction. That is why we as a department believe that Biology majors' courses must always be taught using the in-person (face-to-face) modality.
(2) We continue to develop more hands-on, inquiry-based labs and activities to further develop students' scientific skills. For example, as part of our major's introductory biology course (Biol 120), students conducted a field journaling project spanning several months in their chosen natural setting. We surveyed the students pre- and post-completion of the project. Our focus was on how field journaling affected the students' interest in the natural world and understanding of course topics. Students described reasons for their interest, and if and how the project better connected them to course material. Students across all career plans increased their interest in observing the natural world after completing the journal. Students reported an increased connection to course content as a result of completing their project.
(3) Finally, developing course-based undergraduate research experience (CURE) courses and summer research projects for our students is a major priority of the department, as we believe that undergraduate research strengthens written and oral communication, critical thinking, technical skills, and information literacy.

Part 2.B. Analyze the program review data (please see the program review data retrieval instructions and attach your program review data page with any other supporting documents), the above environmental scan information, and anything else related to your area to identify the program strengths, weaknesses, opportunities, & threats (SWOT):

Strengths	The Biology courses continue to enroll a large number of students (proportion of student enrollment). Many of the courses are prerequisite courses for academic advancement into other AVC programs, including but not limited to the RN, Respiratory Therapy, and other allied health programs.

Based on the 2020-2021 data, our success rates have increased by 7% to 75.6%, which is right at the AVC success rate (students that earn C and higher in classes). However, caution needs to be exercised in this data interpretation. Due to the online nature of instruction (including labs), there was a 5% increase in the number of B's and A's awarded in the program. We believe this increase was an anomaly and we must wait until the next cycle in order to properly assess the growth of success rate. It must be noted that our success rate was on the rise even before the pandemic and it was at 68.6%, which was a 5.7% increase from the previous cycle. When success rate is broken down by race/ethnicity, African American and Hispanics both increased by about 3.8% and 7% respectively, with the highest increase being 9% in White non-Hispanics. Improvements such as these are therefore critical in bringing biology closer to the overall AVC success rate. Finally, our retention rate was around 87.6% which is about the same (87.4%) as last year.

In 2019-2020 we had 17 (AS-BIOLOGY) and 38 (AS-T Biology) degrees awarded, translating to a drop in the number of AS-degrees awarded. This, however, is in line with the decline we experienced due to the pandemic. In 2020-2021 cycle, we had 4369 students enrolled while in 2019-2020 we had 5067 students. This decrease was mostly likely due to the pandemic, as it has affected the whole campus. This growth trend has been happening since 2015. Nevertheless, pre-pandemic, our program was growing. That is why, despite the drop in enrollment, the biology program still accounted to 782.8 FTES (2020-2021) which is 8.44% of the total FTES of AVC. This ranks biology second in the number of FTES generated. That is why Biology continues to be one of the major contributors to both campuses' (Lancaster and Palmdale) FTES and our program is continuing to grow and graduate more students.

The biological/anatomical sciences faculty strongly believe that face-to-face course instruction (with lab) is the most promising modality for developing scientific inquiry, clinical assessment and research skills in our students. Thus, we have focused our efforts in providing high-quality face-to-face courses for our students. Faculty members are not discouraged from developing online or hybrid courses, however, the expectation is that these online courses will either maintain or exceed standards set for the more traditional modalities of instruction. All courses within the anatomy and physiology curriculum have an established and evolving online presence. This also supports the mandate of the California state chancellor's office for planned online curricula in preparation for local or pandemic events that may quickly require a transition from traditional in class instruction to online remote instruction for our students. Faculty that teach online courses have all successfully trained in distance education theory and instructional design. All anatomy and physiology courses offer face-to-face courses, in tandem with either hybrid (Biology 201 and 202) or fully online (Biology 100 and 102) courses. Student demand for online courses within our area often exceeds course availability. Our courses are also supplemented with the cutting-edge technology of two Anatomage Digital Cadaver tables, located within the digital or virtual science equipment room adjacent to the anatomy lab. Structural modifications to the anatomy lab (the addition of requested television monitors connected to the Anatomage tables) along with new Ipads with updated application programs will expand upon and make our virtual anatomy and physiology program even better.

Introduction to Botany (with Honors option), Biol 103, is slowly but steadily becoming an alternative science class with a lab for those students who need to complete their general education, those who want to explore a future career in the field of plant sciences, and those who are part of the Honors program.

While the Introduction to Biotechnology course (Biol 205) has not been offered in over a year, the equipment for that class serves as the foundation for that class when enrollment numbers do increase (as the labor market in the field of biotechnology grows in the Antelope Valley) and is absolutely necessary equipment to grow the CURE component of the General Cell and Molecular Biology class (Biol 110), which is a pre-requisite to Biol 205.

Weaknesses While success rates improved for Hispanics (69.7%) and African Americans (56%), both groups are below the AVC overall rate. These data indicate that maintaining a target on Hispanic (the largest student demographic), African Americans, and students of two or more races can bring the biology success rate much closer to the AVC overall success rate. With the hiring of new faculty and the updates to programs, biology faculty seek to improve the program and address the needs of our diverse student population. The Department will continue to discuss ways to further close this equity gap. Having a dedicated STEM adviser and counselor is of great help in meeting our goals and closing the gap. The differences between males and females, when it came to success rates, were not significantly different.

Although a significant effort has been made (and continues to be made) since Fall 2019 to provide Bio 103 with all the necessary material to offer a quality college-level science class, the class still needs a set of new microscopes (compound and dissecting). They are essential to achieve the SLO under review successfully. Moreover, having a demo microscope handled only by instructors and connected to a screen can be extremely useful to orient students when observing plant structures under the microscopes. This is especially important for students taking a science class for the first time and having difficulties understanding 3D systems under a microscope.

Opportunities In the past few years there have been a number of students participating in undergraduate research (UR) that has resulted in them presenting at scientific conferences and publishing in peer review journals. As more faculty get involved in this endeavor, more students can benefit from this. Thanks to the STEM grant, we have joined the Counsel of Undergraduate Research (CUR) which allows us to explore resources in order to further develop UR in the Biology program. The goal is to have many CURE courses where research is embedded in our majors' courses. In addition, we are exploring opportunities to develop summer micro-internship research opportunities.

General Human Anatomy (Biol 201), General Human Physiology (Biol 202), and General Microbiology (Biol 204) are all prerequisite science course for the AVC RN program. Biol 202 is in dire need of an equipment update. Maintaining necessary science lab equipment is essential for student success in these courses, and will continue to provide a pathway for students' academic advancement to AVC programs, or for transfer. While the field of microbiology in both clinical and research settings

has always relied on biochemical testing as a way to identify microorganisms, the way testing is done is far different from what is currently taught in the microbiology classes. In order to truly present *current* methodologies in microbiology, we need to purchase equipment that matches what is becoming the standard in microbiology labs, namely molecular equipment. In order to prepare our students properly, we must modernize our labs and introduce our students to technology that is seen in labs all over the world.

In order to best serve our biology majors, the cell and molecular biology class (Biol 110) needs updating. There is a need to understand the technology that drives the field of cell and molecular biology. This same technology should also be used in updating our general microbiology class (Bio 204). As mentioned in the previous paragraph, while our current microbiology classes teach methods that have been mainstays in traditional microbiology labs, these methods do not reflect what currently is being used in research, academic, and high-end clinical laboratories across the globe. The field of microbiology has increasingly become molecular when it comes to diagnostic testing, and microbial identification has gone from a 2-day affair to as little as 25 minutes. If we want to teach our students current techniques that will equip them with the skills necessary to navigate through upper division university classes and skills that they can build upon for the job market, then new lab equipment is a necessary addition.

Although Introduction to Botany has shown the same declining trend in enrollment seen in other Biology classes due to the pandemic, more students are choosing this class to complete their GE. In addition, if an alternative career pathway in the area of plant sciences/agriculture is offered, there is an opportunity for this class to increase enrollment in the following years. Overall, in Botany, there is a potential for growth as more students may see Biol 103 as an excellent alternative science course for their general education requirements or for those who have an interest in pursuing a degree in the plant science field. Recently we have contacted the counseling department and we hope to better advertise this class as an alternative to General Biology (Biol 101). This is especially important in lieu of the Biol 101 sections that we have lost in 2020-2021. We also hope to develop an AS-T degree in Agriculture with emphasis in Plant Science. This will not only give students options to purse a degree in plant biology, but might also help in increasing enrollment in the Horticulture program.

Overall, outdated and/or deteriorated laboratory material does not allow for the presentation of current biological themes.

Threats

(1) UH 153 (Biology Majors' labs) in is desperate need for additional storage material. These were approved before the pandemic and we were in the process of getting quotes, but after the pandemic we were told that the money was no longer available. In the past few years we have acquired many expensive instrumentation and material that are used in lab instruction as well as allow us to have CURE in our Biol 110 and 120 classes. The lack of this storage space can lead to (and in some cases have led to) the improper storage of equipment/material. These materials have then become damaged or at severe risk of being damaged and are needed to be in-line with all three of our program goals.

(2) The tentatively published Academic Calendar will cause a reduction in overall biology courses offered during the summer. Furthermore, the proposed 12-week and 6-week summer block schedule with 4-hour and 2-hour lab block-times, respectively, will make it very difficult to offer biology labs that are written and developed to be 3-hour classes. This means that the faculty must completely change the lab manual, set up protocol, etc. Nationwide, biology labs are meant to be three hours and having 4-h or 2-h labs, makes no sense pedagogically. This reduction in sections will ultimately hurt students.

(3) The new way of purchasing is hampering the biology technicians in ordering materials and supplies. As such, some lab exercises will not be able to be set-up and completed by the students. This is not helpful when we are trying to cover our Course Outline of Record (COR) and increase our success rate.

(4) Not having new, well maintained optical instruments of its own (compound and stereomicroscopes), can completely jeopardize 90% of the Botany laboratory content that deal with microscopic and macroscopic structure of plants, as it would with any of our other Biology courses. Currently, Botany has around 16 recycled compound microscopes and zero stereomicroscopes available for use. There is a real need for a minimum of 12 new compound microscopes and 12 stereomicroscopes. This threat was identified during the last cycle, but it has yet to be addressed. However, as enrollment grows, we need to update our Botany laboratories. It must be noted that microscopes are also being used for another course (Pest Control) in the Agricultural/Landscape program. The classroom TE3-111 is also in need of a computer/projector system update in order to have the technologies found in all of the other science labs.

(5) General Human Physiology and General Microbiology are prerequisites for entering the AVC RN program. These courses require lab equipment updates in order to continue the approved course curriculum.

(6) The uncertainty of the next year under a pandemic presents a myriad of problems. Continued quarantines during this pandemic has made instruction difficult, especially for laboratory classes. Thus, as the pandemic continues, the periodic quarantine will be disruptive to student learning. Also, the unavailability of technological tools (that can translate face-to-face labs in online environment) may dampen the program's ability to evolve with changing methods of instruction

Part 2.C. Review and comment on progress towards SLO/PLO/OO Outcomes Analysis (aka Action Plans):

Overall, all of our courses (BIOL 100, 101, 101L, 104, 110, 120, 201, 202 and 204) meet the majority of SLOs. However, the push is to continue to increase our success and develop hands-on labs and activities.

Biology 101 -SLO: Explain the structure of the organelles in the cell and understand their role in the chemical reactions of life: For the two SLOs in Biology 101 lecture, students are at their target goals of meets or exceeds with 75.83% of assessed students (*n* = 1,171) having met or exceeded expectations. Thus, the SLO was met for the 2020-2021 academic year (and for each individual Fall 2020 and Spring 2021 semester).

The current Biology 101 lecture COR includes descriptions of course content that satisfies each SLO and gives the many faculty teaching the course clear outlines of what topics to cover. Many professors devote several lecture days to each SLO topic and employ a variety of teaching techniques including student-led discussions, take-home summary activities. SLO 2 is further reinforced by a field journaling assignment in one classroom.

Future progress: While biology 101 is meeting their goals, we are currently modifying the lab portions and would like to move toward synchronization of topics in both 101 lecture and lab. This may require re-writing the COR for the lecture to match topics with the lab schedule. Synchronization can reinforce the topics covered in the lecture with hands on inquiry-based projects that meet both SLOs for 101 lecture.

Biology 101L – SLO: 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: Currently approximately 1/3 of our labs are devoted to this single SLO. Five labs expose the students to conducting small experiments, data collection and analysis, and interpretation of results. These labs are identified as: Gathering Data and Observations, Diffusion and Osmosis, Enzymes, Photosynthesis, and Cellular respiration. The Genetics lab requires class data collection and analysis, and parts of The Nervous System and Excretory System labs require data collection and analysis. For every lab, students turn in a lab report in which they document results and make interpretations. In our current outcome analysis, Biol 101L is meeting the target goal of 74% of students (*n=893*) at meets or exceeds. This is down slightly from the previous year (77%). While this can be normal fluctuations, this year's analysis is for entirely online semesters, highlighting the need for students to have face-to-face participation in lab-based courses.

Future progress: We must meet the needs of students with up-to-date, high-quality science education. We are in the process of a major revision to this in-demand course (yearly enrollment is approximately 1700 students). A committee of AVC faculty are re-writing the lab manual with a goal to include inquiry-based learning and exposure to the scientific method in every lab. New materials for the course will be essential. We will have entirely new lab projects and experiments almost all labs. Every item listed (see Part 4 for detail and prices) here will be a part of new resources needed for Biol 101, which has not been updated in over 30 years. These items include: Chromebooks (data collection, analysis, and preparation of reports), DNA Gel Electrophoresis Stations (conducting experiments, data collection, hypothesis testing), DNA/RNA modeling kits (collect data, analyze results), Natural Selection Modeling Kits (conducting experiments, data collection and analysis, hypothesis testing), Animal Behavior Kits (conducting experiments, data collection and analysis, hypothesis testing), Amino Acid model set (Data analysis), and DNA model sets (Data analysis).

Biology 103 - SLO: Demonstrate an understanding of the basic plant structure and organization, physiology, and classification. Recognize the relationships among the different groups of plants from an evolutionary perspective: During Fall 2020 and Spring 2021, Biol 103 was solely taught using the synchronous online modality due to the pandemic. The percentage of students who met and met and exceeded the SLO under review here showed an improvement of 10% in Spring 2021 compared to Fall 2020, going from 76% to 86%. This improvement might be the result of a combination of factors: A) students and instructors became more familiarized with the online setting, B) Students obtained technical support and devices provided for the school to better interact with the instructor and complete their work, C) Instructors improved their

teaching material to make students have a better learning experience, and D) Students got the opportunity to review their notes during exams (even if that was not allowed), which helped them to get better scores. We should take these numbers cautiously, given the fact that this period under review should have an asterisk next to it.

An additional improvement was the development of an Honors option for Biol 103, and due to the pandemic, a needed update in classroom technology (projectors and computers) was performed in the lab room 111 in the Horticultural building improving the tools for the instructors to lecture. Biol 103 will slightly start re-introducing inquiry-based activities as classes move to face-to-face modality again. The pandemic halted this process just as it was starting. The faculty coordinator for this class has also begun writing an alternative customized laboratory manual to make the learning process more effective and affordable. The program review submitted during Fall 2019-2020 expressed the need for new optical equipment (compound and dissecting microscopes), in order for students to meet the learning outcomes that under analysis. The use of microscopes is crucial to observe and recognize basic plant structures and are used for the majority of the semester.

Biology 104 - SLO: Demonstrate an understanding of the principles of energy and energy flow in ecosystems, relationships among organisms in ecosystems, or natural biogeochemical cycles in ecosystems, and how humans impact these factors: The achievement target for this SLO is 70%. In Fall 2020, 89.71% of assessed students (n = 68) met or exceeded expectations. In Spring 2021, 85.54% of assessed students (n = 83) met or exceeded expectations. For the Fall 2020 and Spring 2021 semesters combined, 87.42% of assessed students (n = 151) met or exceeded expectations. Thus, the SLO was met for the 2020-2021 academic year as a whole, and for each individual Fall 2020 and Spring 2021 semester. There was minimal variation between these two semesters, with respect to the percentage of students who did not meet expectations (14.16% versus 10.29%). During Spring 2021, the percentage of students who exceeded expectations was higher than during Fall 2020. It is worth noting that during both of these semesters, this class was taught as a synchronous online course in Zoom or as a fully distance education course during the COVID-19 pandemic. No supplies are needed, but we will continue developing inquiry-based and case-study based instructions.

Biology 110 – SLO 1: Describe the components of living cells, and demonstrate how they interact to allow the state of being alive: The cumulative result of this outcome is a bit surprising in that this particular outcome is not tied to the laboratory component of this class. If it were, an SLO "passing rate" of 68% would make sense since it was a year spent in a pandemic-taught semester. It does, however, highlight the effects of a completely Zoom-taught semester. Without the proper reinforcement in the lab, 68% is actually good, but should be a lot better. We will continue to employ both non-traditional and traditional methods of instruction to reinforce this SLO. We also have implemented a cumulative exam across all sections to serve as an extrinsic motivator to promote the importance of this SLO. **Biology 110 – 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:** The fact that ANY student met this outcome is attributed more to how the instructors of this class were willing to adapt the lab to online instruction. The rate of success (40%) shows that a lab (especially a molecular biology lab) cannot truly be taught online, as long as a learning outcome is tied to a true laboratory component. While there is no real alternative to in-person laboratory instruction, we will develop better alternatives in the event that we are forced back to at-

home instruction. Overall, the lab needs to be revamped in order to reinforce and better meet current learning outcomes. While teaching lab online is not feasible long-term, there is a strong need to invest in lab materials to aid in situations where there is no choice BUT to teach online.

Biology 120 - SLO: Students will be able to use the theory of evolution as a scientific explanation for the unity and diversity of life on earth. They will be able to use specific examples to explicate how descent with modification has shaped organismal morphology, physiology, life history, and behavior: While the SLO as a whole for the year was met (79.7% met or exceeded), there seems to be a serious fluctuation with the success in meeting the SLO in different semesters. In Spring 2021, about 14% of the students met and exceeded the SLO, while in Fall 2020 only about 4% met and exceeded. At face value, this looks like a good thing, however, this fluctuation happened every cycle. This is an interesting trend that should be investigated. Finally, we need to exercise caution interpreting the 2020-2021 results due to online nature of instructions. Despite the faculty's best and creative efforts to deliver instruction online, we cannot replicate the authentic experience of a biology class, especially in laboratory settings. This highlights the importance of not only having face-to-face instruction in the sciences (specifically in the biological sciences), but also having the tools needed for students to conduct inquiry-based learning. That is why we recommend that Biol 120 labs must always remain face-to-face so we can make sure the students are properly learning the material via inquiry-based education. As such, purchasing equipment and supplies needed for inquiry-based education, such as course based undergraduate research, is of outmost importance. Biol 120 continues to have inquiry-based and hands-on lab activities. For example, the labs have a designated research project, field journal and online modeling of population genetics. This allows students to get hands-on experience in research, relate subject material to the field, and observe the effect of selection and drift over multiple generations. We recommend that through training, professional development, and conference attendance, we can expand research opportunities for students and increase hands-on inquiry-based class in our department.

Biology 100 – SLO: Demonstrate an understanding of the structural organization of the human body systems; examine microscopic and macroscopic structures, compare relative locations of structures, describe composition of structures and interrelate function of structures: The SLO achievement target objectives for the academic year were successfully met, in which (100%) of assessed students met or exceeded the established criteria. The course sections were offered online. However, the purchase of supplementary licensed applications for the online course sections will enhance instruction and provide students with optional course exercises. The addition of these applications to the course is projected at a cost of several thousand dollars. Face-to-face section offerings (if applicable) will require the addition of laboratory equipment that will be appropriate and specific to the number of students in the course. UH 133 does not have adequate equipment, supplies or current technician support to meet face-face instructional needs (if warranted) for the Biology 100 course.

Biology 102- SLO: Demonstrate the ability to use laboratory equipment and techniques safely and in a group setting: The SLO achievement target objectives for the academic year were successfully met, in which (100%) of assessed students met or exceeded the established criteria. The course sections were offered online. However, the purchase of supplementary licensed applications for the online course sections will enhance instruction and provide students with optional course exercises. The addition of these applications to the course is projected at a cost of several thousand dollars. Face-to-face section offerings (if applicable) will require the addition of laboratory equipment, that will be appropriate

and specific to the number of students in the course. UH 133 does not have adequate equipment, supplies or current technician support to meet face-face instructional needs (if warranted) for the Biology 102 course.

In regards to implementing inquiry-based learning and CURE, proposed projects for the Biology 100 and 102 courses include public health research with participating faculty and work in the forensics sciences.

Biology 201 – SLO: Demonstrate an understanding of the structural organization of the human body systems; examine microscopic and macroscopic structures, compare relative locations of structures, describe composition of structures and interrelate the functions of structures: Out of 307 total students, 222 exceeded or met criteria (72.3%), 54 did not meet criteria (17.6%) and 31 were listed as "not applicable" (10.1%). The achievement target of 70% was met for this learning outcome. The current anatomy faculty have identified the needs for new faculty positions and items to continue to provide the most current, professional-level education to as many anatomy students as possible. These hires and items to purchase are relevant for both online/hybrid instruction and face-to-face instruction when it is safe for students and instructors to return to campus.

Biology 202- SLO: Define and comprehend how the human body works by constructing a cascade of molecular and cellular events that lead to normal physiological responses in metabolism and in the nervous, endocrine, muscular, cardiovascular, respiratory, renal, digestive, reproductive, and immune systems: The SLO as a whole for the year were met (85.5% met or exceeded). In Spring 2020, we had to switch to remote teaching due to the pandemic. This reduced the ability of faculty to meet with the students on a regular basis and affected the presentation of the lecture and lab materials. Furthermore, this limited the students to proper access to equipment they needed for their work. This highlights the important of not only having face-to-face instruction in the sciences, especially in the case of physiology, but also having the tools and the equipment needed for students to conduct active learning and hands-on laboratory experiments. In addition, we had two faculty members retiring last year. The courses in anatomy and physiology are major contributors to the enrollment of the biological sciences division. Although the majority of our course SLOs were met, progress in the area of updated laboratory models and supplies, updated technology, and faculty hires will improve our program needs greatly. We are cognizant of the importance of our faculty reflecting the diversity of the students that we instruct. We are also interested in (and plan to become) contributing members of the nascent undergraduate research program.

Biology 204 –SLO: Describe the characteristics of the 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: Out of 234 students, 191 (i.e 81.6%) of the students achieved the target. As many have stated in this review, while these data have been collected, a great amount of scrutiny must be used in analyzing *why* the numbers are so high. We will continue current instructional methods until we can implement the aforementioned improvements to modernize the microbiology labs, as presented in part 2b of this review.

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

Goal 1) Reform instructional methodology to include Inquiry-based learning. We are continuing to develop more inquiry-based, hands-on labs in our majors classes. In previous semesters, this work has led to students doing undergraduate research (UR) work that has led to publication. We are continuing this effort and the goal is to spread this inquiry-based education to the non-majors classes such as Biology 101. Recently, a committee of Biology 101 faculty have remapped the lab manual (that will be used in Fall 2022) and this manual emphasizes hands-on inquiry-based activities.

Goal 2) Improvement of student learning outcomes. The grade distribution in biology classes tends to follow a normal distribution curve. This suggests that we do not have any potential grade inflation occurring. As mentioned previously, the success rate has gone up; however, caution is needed in its interpretation due to the online nature of instruction. With the virtual anatomy room being more accessible, we project further improvement in Anatomy students.

Goal 3) Develop an undergraduate research (UR) program. A few faculty members are conducting research with some of their students with some success. Recently, we had one paper published with students presenting their work at a conference. In addition, we have ongoing projects that involve students doing research. Biology 120 classes continue to promote UR as part of the class curriculum. Finally, we are planning a group discussion in order to further develop the culture of UR on campus.

Part 3. Based on Part 2 above, please list program/area goals for 2021-2022:

Program/Area Goal #	***Goal supports which ILO/PLO/SLO/OO?***	***Description of Goal***	***Steps to be taken to achieve goal?***
1: Reform instructional methodology to include Inquiry-based learning.	ILOs 1,2 & 3 PLOs 1 & 5	Instituting inquiry-based learning in more courses.	Having workshops on developing hands-on lab activities and rewriting lab manuals. Sharing literature on how to develop more inquiry-based labs. Finally, by purchasing more supplies and equipment we can develop more hands-on labs for students (this last part also applies to goal 2).
2. Improvement of student learning outcomes.	ILOs 1,2 & 3 PLOs 1-5	Increase student success rates.	Trying to develop ways to identify students that are struggling earlier in the semester and referring them to proper services. Developing review

3. Develop an undergraduate research (UR) program.	ILOs 2 & 3 PLOs 1 & 5	Increasing faculty participation in mentoring student research.	workshops that students can attend when struggling. A group of faculty are reading literature and attending UR conferences in order to get ideas on how to implement a permanent UR program on campus. We are also holding discussions and developing UR projects for students to perform in majors' courses.

Part 4. Resource Requests that Support Program Needs (Based on above analyses and listed in priority order):

Type of Resource Request	*Summary of Request*	*New or Repeat Request*	*Amount of Request, $*	*One-Time or Recurring Cost, $*	*Contact's Name*
Faculty	Anatomy & Physiology Faculty (replacement)	New	$54,00-80,000	*Recurring*	Barbara Fredette & Zia Nisani
Classified Staff					
Physical/Facilities	Storage cabinets in UH 153	New	Varies	One-time	Zia Nisani & Jedidiah Lobos
Technology (Biol 103)	6 - Compound microscopes 6 - dissecting microscopes	Repeat	$ 24,000	One-time	P. Palavecino
Technology (Biol 202)	6 – AD Instruments PowerLab 15T	Repeat	@ $1595 each ($9570 total)	One-time	Joseph Esdin
	6 – AD Instruments LabChart 8 software	Repeat	@ $1495 each ($8970 total)	One-time	Joseph Esdin
	6 – AD Instruments Physiology Kits	Repeat	@ $370 each ($2220 total)	One-time	Joseph Esdin
	6- AD Instruments Reusable ECG Electrodes	Repeat	@ $105.50 each ($633.00 total)	One-time	Joseph Esdin
	6 - 15-inch Apple MacBook Pro (Touch Bar and Touch ID, 2.2GHz 6-Core Processor, 256GB Storage)	Repeat	@ $2,399 each ($14,394 total)	One-Time	Joseph Esdin

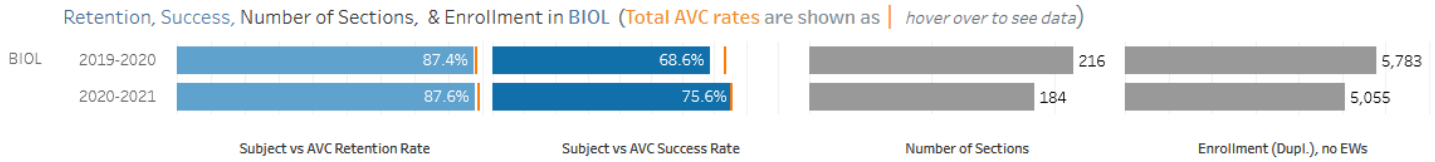
	6 – Apple Mac USB-C multiport converters (Amazon)	Repeat	@ $69 each ($414 total)	One-Time	Joseph Esdin
Technology/supplies (Biol 101L)	55 – Chromebook	NEW	@ $119 each ($6545 total)	One-time	Lena Coleman
	12 – DNA Gel Electrophoresis Stations	New	@ $706 each ($8472 total)	One-time	
	2 sets – DNA/RNA modeling kits	New	@ $231 each ($462 total)	One-time	
	2- Natural Selection Modeling Kit	New	@ $67.25 each ($134.5 total)	One-time	
	2 - Animal Behavior Kit	New	@ $129 each ($258 total)	One-Time	
	4 – Amino Acid model set	New	@ $201 each ($804 total)	One-Time	
	24 - DNA model set	New	@ $28 each ($672 total)	One-Time	
Technology (Biol 201)	Practice Anatomy Lab (PAL) programs	New	($29.99 ea for 224-310 students)	One-Time	Barbara Fredette
	26-9th generation iPads	New	$8554 ($329 ea)	One-Time	
	3D4 Medical Anatomy Apps for all iPads + faculty licenses	New	$7500/yr	Recurring	
	Two Elmo MO-1 Visual Presenters	New	$918 ($459 ea)	One-Time	
	Life-size human muscle figure: $9750	New	$9750	One-Time	
	ViewSonic PX747-4K Projector Ultra	New	$1089	One-Time	
Supplies (Biol 201)	813023 Somso Kidney Structures (replacement)	Repeat	$680	One-time	Barbara Fredette

	813199 3D Female Pelvis (replacement)	Repeat	$215	One-time	
	811173 3D Male Pelvis (replacement)	Repeat	$215	One-time	
	823613 (2) Male Skulls (replacement)	Repeat	$300 each ($600 total)	One-time	
	823613 (2) Female Skulls (replacement)	Repeat	$290 each ($580 total)	One-time	
	813148 Visible Muscle System, desktop (new)	Repeat	$660	One-time	
	813810 3D Pregnancy Model Set (new)	Repeat	$925	One-time	
	814010 Somso Cavities of the Nose/Mouth (new)	Repeat	$655	One-time	
	676835 Rat Anatomy Museum Mount (new)	Repeat	$450	One-time	
	Purchase and mount 2 narrow-bezel 60” LCD TVs side-by-side above the white boards in UH 127	Repeat	$10,880.10	One-time	Bill Carlson (IT)
Supplies (Biol 110/Biol 204)	BD EnteroPluri Test x 2	New	$1500	Recurring	Jedidiah Lobos
	Qiagen Microbial DNA qPCR Assay #330025	New	$3961	Recurring	
		New	$3961	Recurring	

	Qiagen Intestinal Infections qPCR Assay #330025	New	$3961	Recurring	
	Qiagen Intestinal Infections 2 qPCR Assay #330261	New	$3961	Recurring	
	Qiagen Urinary Tract Infection qPCR Assay #330261	New	$18474.05	One-time	
	AriaMx Real-time PCR system #76193-704	New	$256.32	Recurring	
	SYBR Qualification Plate Kit #76193-640	New	$320.97	Recurring	
	AriaMx 96 Well Plates, Rigid, Skirted #76193-376	New	$225.70	Recurring	
	AriaMx Adhesive Seals #76193-584	New	$225.70	Recurring	
	AriaMx Tube Strips #76193-632	New	$256.32	Recurring	
	AriaMx 96 Well Optical Plate #76193-634	New	$23.80	Recurring	
	Mx3000P Optical Strip Caps #99901-796				
Professional Development	More training on undergraduate research design and instrumentation to achieve our goal of expanding research opportunities for students.	New	$6000	Recurring	Zia Nisani
Other	Cadaver replacement for current female cadaver $3,400 (includes delivery and exchange)	New	$3,400 (includes delivery and exchange)	One-Time	Barbara Fredette

****REQUIRED: After gathering the information above, fill out your RESOURCE REQUESTS to be shared with the Budget Committee: https://www.surveymonkey.com/r/20-21ProgramReview**

Part 5. Insert your Program Review Data here, as well as any other supporting data. (See Part 2.B above.)



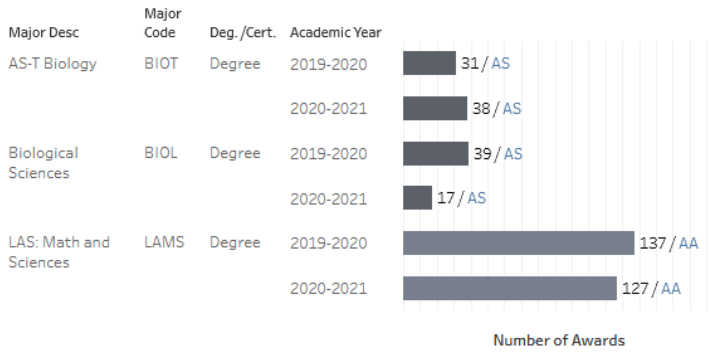
Enrollment and Number of Sections by *Modality* in BIOL

	Instr. Method	2019-2020	2020-2021
Number of Sections	Online	21	25
	Traditional	195	159
Enrollment	Online	668	698
	Traditional	5,340	4,369

Enrollment and Number of Sections by *Location* in BIOL

	Location	2019-2020	2020-2021
Number of Sections	Lancaster	198	164
	Palmdale	18	20
Enrollment	Lancaster	5,564	4,610
	Palmdale	444	457

Number of Degrees/Certificates Awarded in AS-T Biology (BIOT), Biological Sciences (BIOL), LAS: Math and Sciences (LAMS)

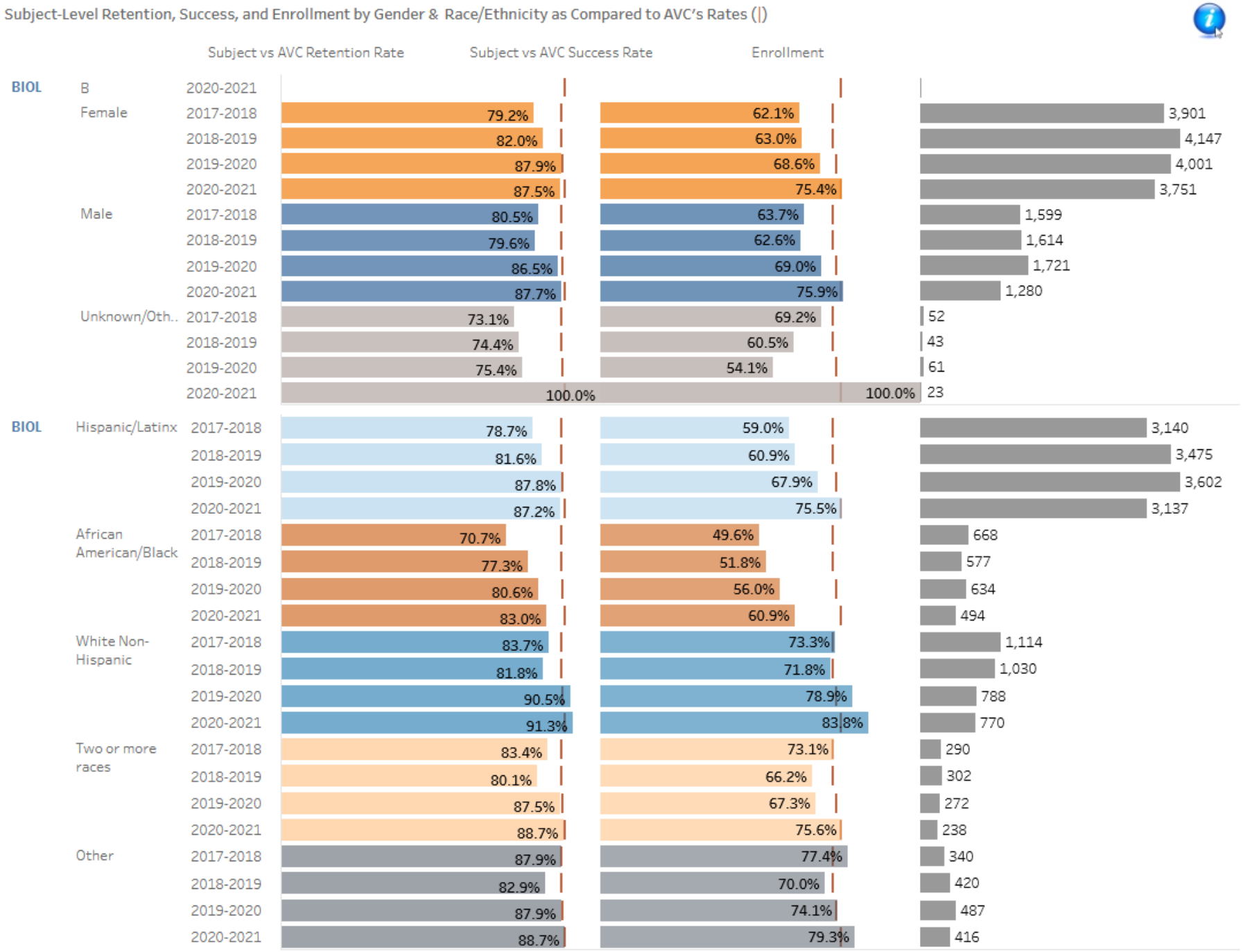


FTEF by Contract Type, Part-time/Full-time Ratio, FTES, FTES/FTEF in **BIOL**

	Fall 2017	Fall 2018	Fall 2019	Fall 2020
PT (Adjunct) FTEF	7.3	8.8	8.4	6.7
FT (Regular) FTEF	13.7	13.5	12.4	12.8
FT (Overload) FTEF	2.9	3.3	3.7	4.1
TOTAL FTEF	23.9	25.7	24.5	23.6
PT/FT FTEF Ratio	0.5	0.7	0.7	0.5
FTES	345.4	359.6	344.3	340.5
FTES/FTEF Ratio	14.4	14.0	14.1	14.4
WSCH/FTEF Ratio	433.0	420.3	422.1	432.8

Click here to see AVC's Program awards dashboard

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



Select Demographics

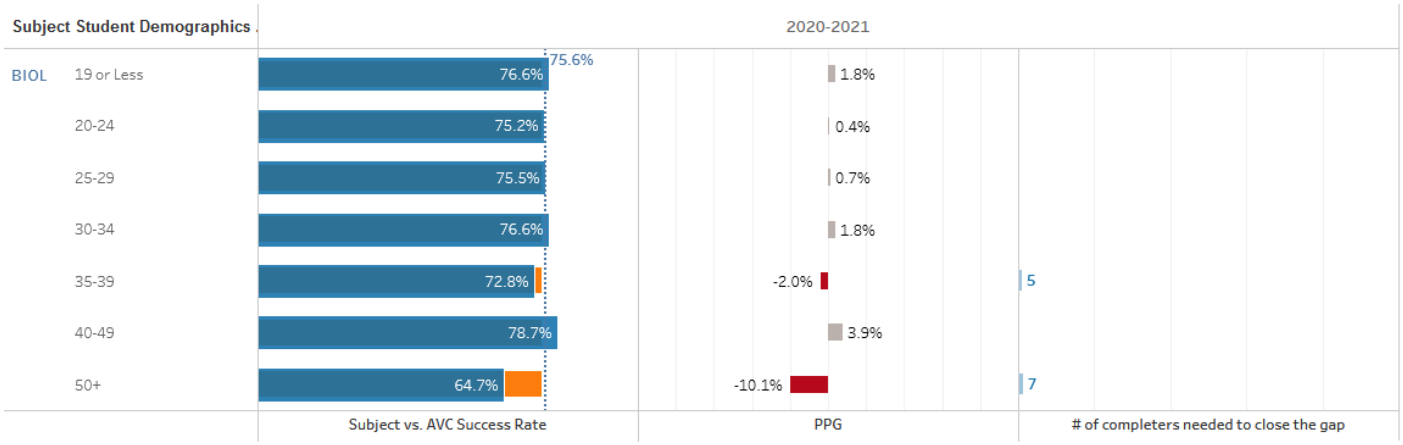
Age Groups

Academic Year Slider

Click to Include EWs

2020-2021 Disproportionate Impact (DI) as Percentage Point Gap (PPG)

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



In 2020-2021, BIOL's Success Rate was 75.6% vs. AVC's Annual rate of 74.8%

Overall Disproportionate Impact as percentage point gap was : 0.8%

In BIOL, 5,055 was the enrollment count (duplicated headcount) (only shows if $n > 10$)

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

*(For example, (5,055 * |0.8%|)=43. it means that 43 more successful course completers would help close the gap for this subject area)*

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

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

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

Select Subject again

BIOL

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

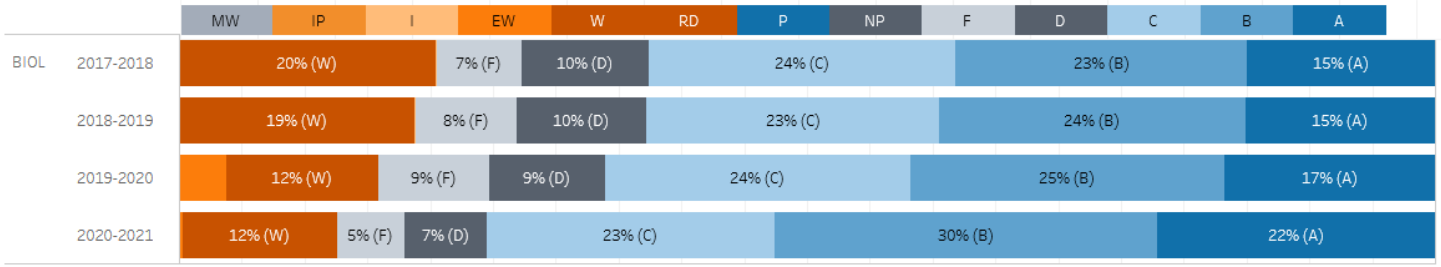
FTEF by Contract Type, Part-time/Full-time Ratio, FTES, FTES/FTEF in **BIOL**

	Fall 2017	Fall 2018	Fall 2019	Fall 2020
PT (Adjunct) FTEF	7.3	8.8	8.4	6.7
FT (Regular) FTEF	13.7	13.5	12.4	12.8
FT (Overload) FTEF	2.9	3.3	3.7	4.1
TOTAL FTEF	23.9	25.7	24.5	23.6
PT/FT FTEF Ratio	0.5	0.7	0.7	0.5
FTES	345.4	359.6	344.3	340.5
FTES/FTEF Ratio	14.4	14.0	14.1	14.4
WSCH/FTEF Ratio	433.0	420.3	422.1	432.8

AVC Total

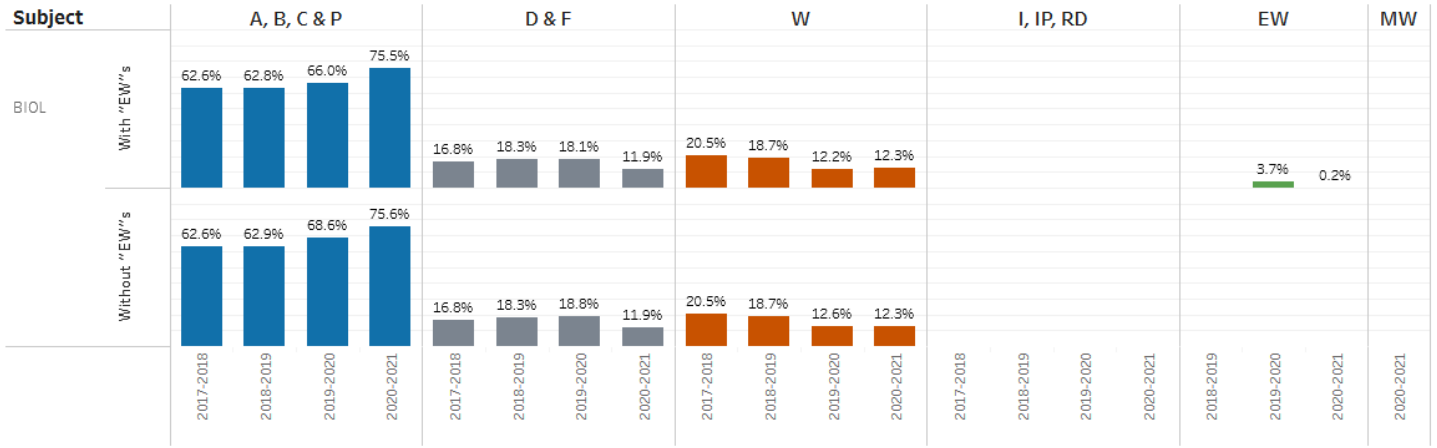
	Fall 2017	Fall 2018	Fall 2019	Fall 2020
PT (Adjunct) FTEF	191.5	187.9	188.5	164.9
FT(Regular) FTEF	161.1	163.9	151.2	153.7
FT (Overload) FTEF	27.3	27.6	38.0	35.3
TOTAL FTEF	380.6	379.5	377.6	353.9
PT/FT FTEF Ratio	1.2	1.1	1.2	1.1
FTES	4,947.2	4,929.1	4,884.4	4,255.1
FTES/FTEF Ratio	13.0	13.0	12.9	12.0
WSCH/FTEF Ratio	390.0	389.7	388.0	360.7

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



BIOL (only shows if n >10)

Minor variation in numbers might occur due to rounding



Full Time Equivalent Faculty (FTEF) by Contract Type (Part-Time, Full-Time, FT/Overload) and by Term
(FTEF = LHE/15)

(The calculations exclude reassigned time)

	2017-2018						2018-2019						2019-2020						2020-2021					
	Fall 2017			Spring 2018			Fall 2018			Spring 2019			Fall 2019			Spring 2020			Fall 2020			Spring 2021		
	PT/Adj..	FT/Reg..	FT/Ove..	PT/Adj..	FT/Reg..	FT/Ove..	PT/Adj..	FT/Reg..	FT/Ove..	PT/Adj..	FT/Reg..	FT/Ove..	PT/Adj..	FT/Reg..	FT/Ove..	PT/Adj..	FT/Reg..	FT/Ove..	PT/Adj..	FT/Reg..	FT/Ove..	PT/Adj..	FT/Reg..	FT/Ove..
BIOL	7.3	13.7	2.9	7.8	13.3	2.5	8.6	13.5	3.3	8.8	12.2	3.3	8.4	12.4	3.7	8.4	11.4	4.4	6.7	12.8	4.1	6.2	12.0	2.9
Grand..	7.3	13.7	2.9	7.8	13.3	2.5	8.6	13.5	3.3	8.8	12.2	3.3	8.4	12.4	3.7	8.4	11.4	4.4	6.7	12.8	4.1	6.2	12.0	2.9

Annualized FTEF by Contract Type (Part-Time, Full-Time, FT/Overload, Total) in Major Terms.
[(Fall LHE + Spring LHE)/30]

	2017-2018				2018-2019				2019-2020				2020-2021			
	PT/Adjun..	FT/Regul..	FT/Overl..	Total	PT/Adjun..	FT/Regul..	FT/Overl..	Total	PT/Adjun..	FT/Regul..	FT/Overl..	Total	PT/Adjun..	FT/Regul..	FT/Overl..	Total
BIOL	7.6	13.5	2.7	23.8	8.7	12.8	3.3	24.9	8.4	11.9	4.0	24.4	6.5	12.4	3.5	22.4
Grand Total	7.6	13.5	2.7	23.8	8.7	12.8	3.3	24.9	8.4	11.9	4.0	24.4	6.5	12.4	3.5	22.4

Success (and Enrollment) Numbers in Subject(s) BIOL by Academic Year (Hover over the numbers for Retention)

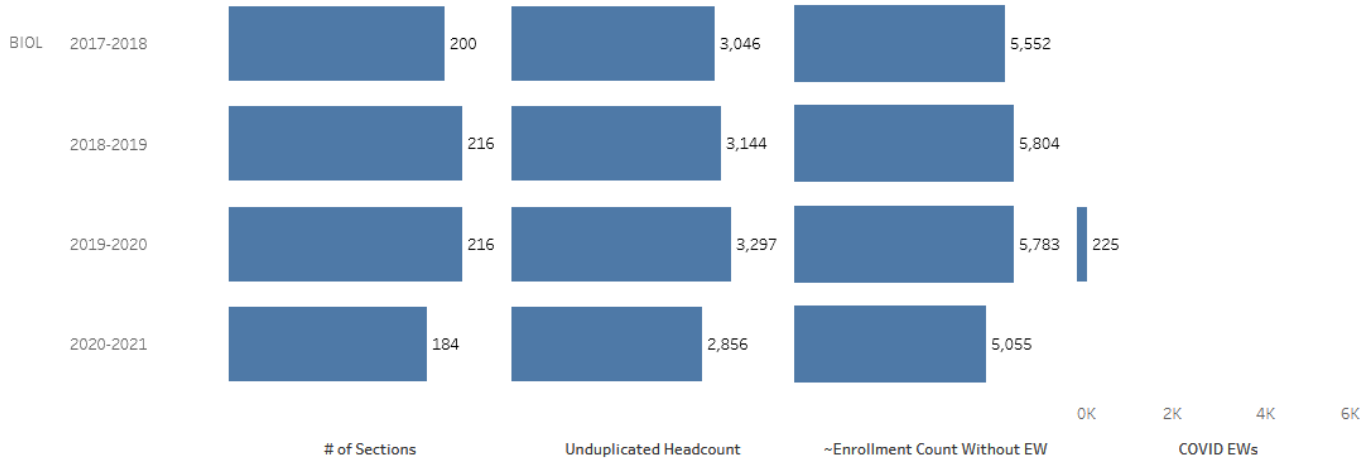
	2017-2018	2018-2019	2019-2020	2020-2021	Grand Total
BIOL	62.6% (5,552)	62.9% (5,804)	68.6% (5,783)	75.6% (5,055)	67.2% (22,194)
Grand Total	62.6% (5,552)	62.9% (5,804)	68.6% (5,783)	75.6% (5,055)	67.2% (22,194)

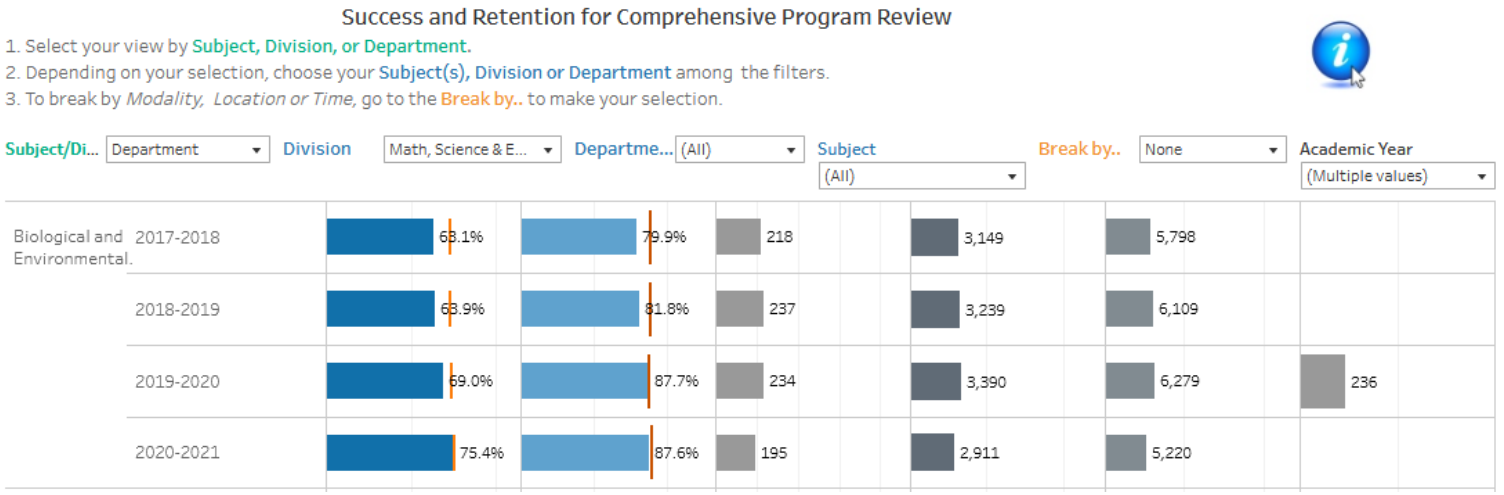
Enrollment, Number of Sections by Course Number

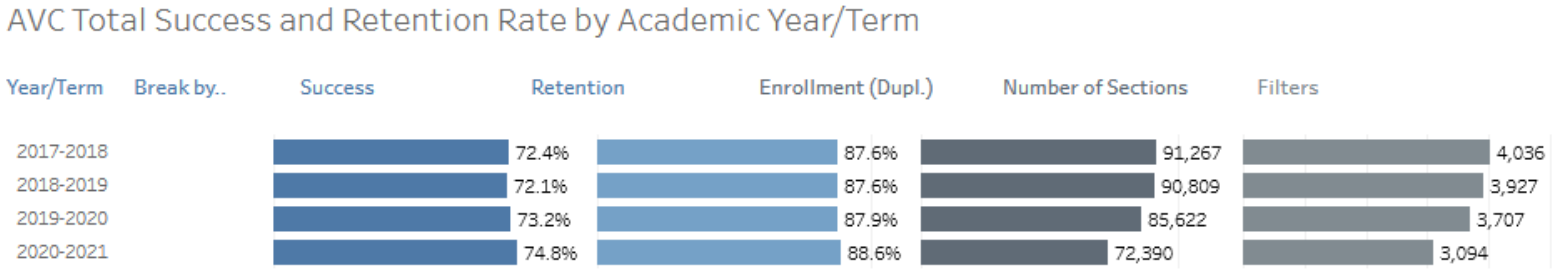
Annual or Term: Annual

Term: (All)

Select a Course Number: (All)







ANTELOPE VALLEY COLLEGE

2020-2021 Program Review Report

Division/Area Name: Chemistry	**For Years: 2021-2022**
Name of person leading this review: Dr. Jessica Harper	
Names of all participants in this review: Dr. Neil Quebbemann, Dr. Alexandra Schroer, Carlos Hernandez, Dr. J Cooper, (Maria Groth in Fall 2021) Met October 14th, Oct 20th,2021 and subsequent email discussions	

Part 1. Program Overview:

1.1.Briefly describe how the program contributes to the district mission

Chemistry is in the top 5 in the percentage of all AVC's FTES (4% in 2020-21 major terms as compared to 2.8% in 2013-2014). The number of FTES in 2020-21 (major terms) was 369. Chemistry classes are part of the AS-T Chemistry, LAS-Math and Sciences, and Physical Sciences degrees. Chemistry is a prerequisite for various biology courses, Engineering, kinesiology courses and the nursing program.

1.2.State briefly program highlights and accomplishments

-- success rate decreased slightly probably due to online teaching, especially among AA/black students from -17% (2016) to –negative 21% (2021).
--females and males increased slightly in success (from 66% (2016) to 67.2% (2021) –
-AS-T chemistry degrees increased from 16 (2018) to 31(2019); decreased in 2020 due to COVID but went up to 22 in 2021.
--enrollment is holding steady, although there were more course offerings; however, summer 2021 was not a success especially when it came to retention. The old 8 week calendar served Chemistry better.
--we were on par with AVC success (72.1% CHEM; 73.2% AVC) and retention (85.7% CHEM; 87.9%AVC) but 2021 the success rate is 7 percentage point lower than AVC.
--faculty were trained on HPLC instrument (high performance liquid chromatography)in 2019 but since then we did not work with the instrumentation due to the lockdown.
--various classes were regularly using the laboratory instrumentation that has been purchased over the past few years. NMR, IR, UV, GC/MS, polarimeter before the lockdown, however during COVID nobody used them.
--PT/FT ratio slightly decreased from 1.1; to 0.8.
FT overload grew from 1.7 (2017) to 2.6 (2019) but decreased in 2021 to 1.7.
PT was stable and FT increased 4.5 to 5.7 due to hiring a new FT.

One FT retired in summer therefore we need to hire a new FT in Fall 2021.
No new accomplishments since COVID kept us home.

***1.3. Check each** Institutional Learning Outcome (ILO) **supported by the program.** Type an "X" if checkbox is unavailable.*

☐X **Communication**	X Demonstrates analytical reading and writing skills including research, quantitative and qualitative evaluation and synthesis. X Demonstrates listening and speaking skills that result in focused and coherent communications
☐X **Creative, Critical, and Analytical Thinking**	x Uses intellectual curiosity, judgment and analytical decision-making in the acquisition, integration and application of Knowledge and skills. X Solves problems utilizing technology, quantitative and qualitative information and mathematical concepts.

☐ **Community/Global Consciousness**	X☐ Understands and applies personal concepts of integrity, ethics, self-esteem, lifelong learning, while contributing to the well-being of society and the environment. X Demonstrates an awareness and respect of the values of diversity, complexity, aesthetics and varied cultural expressions.
☐**x Career and Specialized Knowledge**	x Demonstrates knowledge, skills and abilities related to student educational goals, including career, transfer and personal enrichment.

***1.4. Check each** Educational Master Plan (EMP)/Strategic Plan Goal **supported by the program.** Type an "X" if checkbox is unavailable.*

☐x **Goal 1*:** Commitment to strengthening institutional effectiveness measures and practices.

☐x **Goal 2*:** Increase efficient and effective use of resources: Technology; Facilities; Human Resources; Business Services.

☐x **Goal 3:** Focus on utilizing proven instructional strategies that will foster transferable intellectual skills.

☐ **Goal 4*:** Advance more students to college-level coursework-Develop and implement effective placement tools.

☐x **Goal 5:** Align instructional programs to the skills identified by the labor market.

*Indicates College-Wide Priorities for 2019-2020

Part 2.A. Please provide the results of any internal and external environmental scan information you have gathered related to the program e.g. surveys, interviews, focus groups, advisory groups, licensure exam scores, job placement, State mandates, etc.:

- COVID survey results indicated that majority of students preferred the synchronous method of instruction when no face-to-face was available.
- Searches of employment statistics for chemists indicate a sustained need, with a slight (4-7%) increase in demand. https://www.labormarketinfo.edd.ca.gov/

Part 2.B. Analyze the program review data (please see the program review data retrieval instructions and attach your program review data page with any other supporting documents), the above environmental scan information, and anything else related to your area to identify the program strengths, weaknesses, opportunities, & threats (SWOT):

Strengths	--Degree completion kept increasing although COVID affected most disciplines in enrollment. – -There is a lab full of research grade instrumentation available for student experience and research, however due to the lockdown it has not been used.
Weaknesses	Enrollment is holding steady. Summer 2021 was a concern. The LHE from Intersession 2021 was not made up during summer. 4 fewer sections were offered last year.
Opportunities	– We returned to campus F2F and we hope that students will perform better and that the success rate will increase.
Threats	– Coronavirus – on-line labs (particularly for students progressing through the chem. sequence),

- lack of hands-on lab experience leading to unpreparedness for research upon transfer,
- decreased math skills; the math requirement for CHEM 120 was reduced to Math 102. Because this course requires familiarity with logarithms, using the quadratic equation, and graphing, valuable class time is being wasted in review and reminding students to take advantage of the math resources at the Learning Center;
- eliminated intersession and changed summer schedule impacts offerings of majors-level courses –6 weeks is too short, 12 weeks still requires odd revisions to lab schedule and not enough teachers available at that time.

Part 2.C. Review and comment on progress towards SLO/PLO/OO Action Plans:

- SLOs were all reworked to be broader, were approved in Curricunet by AP&P,and were finally accepted in eLumen 3 years after first entry in eLumen.
- SLOs targeted for analysis are

-CHEM 101 (SLO1): "Students will show ability in problem solving with respect to chemical reactions qualitatively and quantitatively."
This Chem 101 SLO was met or exceeded by 75%. Because this SLO is new, there is no previous data with which to compare, but the number seems unusually high. The assessment method will be reviewed.

-CHEM 110 (SLO1): "Quantitatively and qualitatively evaluate various aspects of a multitude of chemical reactions and evaluate different bonding theories."
The inconsistent data from this SLO will benefit from having a consistent assessment method. A meeting will be held among faculty teaching this course to prepare some common questions to be given on the course final in all sections.

-CHEM 120 (SLO2): "Evaluate thermodynamic and kinetic factors to determine the equilibrium position of a chemical system."
It is proposed that the marked difference between fall 2020 (82% did NOT meet expectations) and spring 2021 (39% did not meet) may be due to availability of SI in spring. An SI leader has been recruited for Spring 22. If data in Fall 21 (without SI) is abysmal while spring 22 data (with SI) is better, it will support this hypothesis. If the data does not support the hypothesis, we will reexamine contributing factors.

-CHEM 210 (SLO 1): "Assess the outcome of an organic reaction and develop a reasonable mechanism for an organic reaction."
Spring 2020 (100% met or exceeded) and Fall 2020/Spring 2021 combined had 93.3% of the students meet or exceed this SLO. This seems unusually high compared to previous year (for example Fall 2019, where 50% met or exceeded expectations) and is attributed unfortunately to students using resources not permitted in class. Being face to face again is likely to result in a more realistic assessment. To improve the SLO target from Fall 2019, an incorporated SI and help from the Learning Center is greatly needed.

-Similar conclusion was made for CHEM 102, where 100% of students met or exceeded SLO1 ("Differentiate between the classifications of organic molecules and relate these to an IUPAC or common name, a properly constructed structure, and their associated physical and chemical properties.")

-CHEM 220 (SLO1): "Relate structure and spectroscopic data. Describe structure and properties from collected spectroscopic data."
This SLO was barely met, with 71.43%.This could be due to the fact that during Fall 2020 and Spring 2021 no hands on lab was conducted due to COVID. We hope to stay face to face and also make use of our instrumentation. Supplies, preventative maintenance and training are needed to keep instruments available.

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

Goal #1 While teaching chemistry online made for inconsistent SLO analysis, data likely supports critical need for SI leaders in all classes. Instructors are recruiting SI leaders for all courses.
Reliable printers, accessible from labs, classrooms and offices, will improve student access to their lab data, facilitating development of analytical skills.
Goal #2 Retention and success dropped when chemistry classes could only be offered online. Forward progress for this goal was stifled by COVID restrictions.
Goal #3 No progress was made on this goal during the shutdown.

Part 3. Based on Part 2 above, please list program/area goals for 2020-2021:

Program/Area Goal #	***Goal supports which ILO/PLO/SLO/OO?***	***Description of Goal***	***Steps to be taken to achieve goal?***
Goal #1	ILO/PLO/SLO	Continuously improve SLOs that are underperforming, maintain those in which students are already exceeding expectations.	Hire fulltime faculty to ensure that quality instruction is provided rather than by overloaded instructors, particularly in light of Jul 2021 retirement of fulltime faculty member. Make sure SI and tutors are provided by Learning Center for each class.

Goal # 2	ILO/PLO/SLO	Increase the number of AS-T chemistry awards	Maintain course offerings in face of budget cuts; encourage students to seek degree awards. Ensure lab supplies support the demand now that we're back on campus using lab instrumentation.
Goal # 3	ILO/PLO/SLO	Undergraduate Research	Faculty to be trained on lab instrumentation.

Part 4. Resource Requests that Support Program Needs (Based on above analyses and listed in priority order):

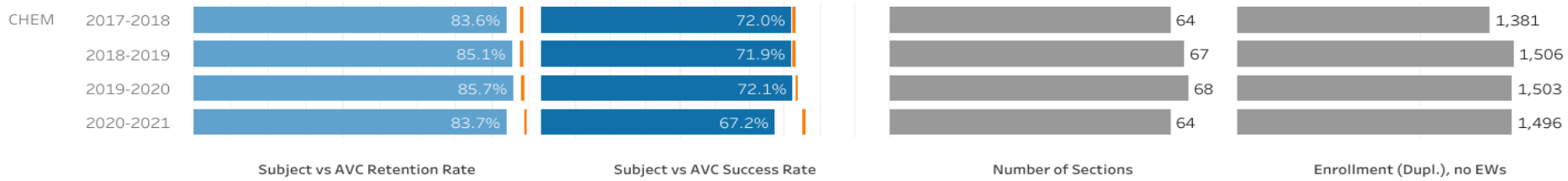
Type of Resource Request	*Summary of Request*	*New or Repeat Request*	*Amount of Request, $*	*One-Time or Recurring Cost, $*	*Contact's Name*
Faculty	New full-time faculty member is needed in order replaced retired FT.	repeat	TBD	TBD	Chemistry Department
Classified Staff	none				
Technology	Educational grade Gas Chromatography unit to replace 37 year old instrument.	new	45K		Chemistry Department
Physical/Facilities	none				
Supplies	HPLC and GC/MS and NMR require specific solvents, gases and glassware that need to be included in budget. Preparatory column. These are necessary to support lab-related SLOs and ensure support undergraduate research.	repeat	50K	recurring	Chemistry Department
Professional Development	More training on undergraduate research design and instrumentation to achieve our goal of expanding research opportunities for students.	repeat	5K	recurring	Chemistry Department
Other	Student help to support instructors during labs and more embedded tutors/SI in lecture to support Goal #1.	repeat	5K	recurring	Chemistry Department

Part 5. Insert your Program Review Data here, as well as any other supporting data. (See Part 2.B above.)

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

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

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



Enrollment and Number of Sections by ***Modality*** in CHEM

	Instr. Method	2017-2018	2018-2019	2019-2020	2020-2021
Number of Sections	Traditional	64	67	68	64
Enrollment	Traditional	1,381	1,506	1,556	1,498

Enrollment and Number of Sections by ***Location*** in CHEM

	Location	2017-2018	2018-2019	2019-2020	2020-2021
Number of Sections	Lancaster	63	64	65	61
	Palmdale	1	3	3	3
Enrollment	Lancaster	1,361	1,446	1,484	1,433
	Palmdale	20	60	72	65

Number of Degrees/Certificates Awarded in AS-T Chemistry (CHMT)

Major Desc	Major Code	Deg. /Cert.	Academic Year	
AS-T Chemistry	CHMT	Degree	2017-2018	16 / AS
			2018-2019	31 / AS
			2019-2020	19 / AS
			2020-2021	22 / AS

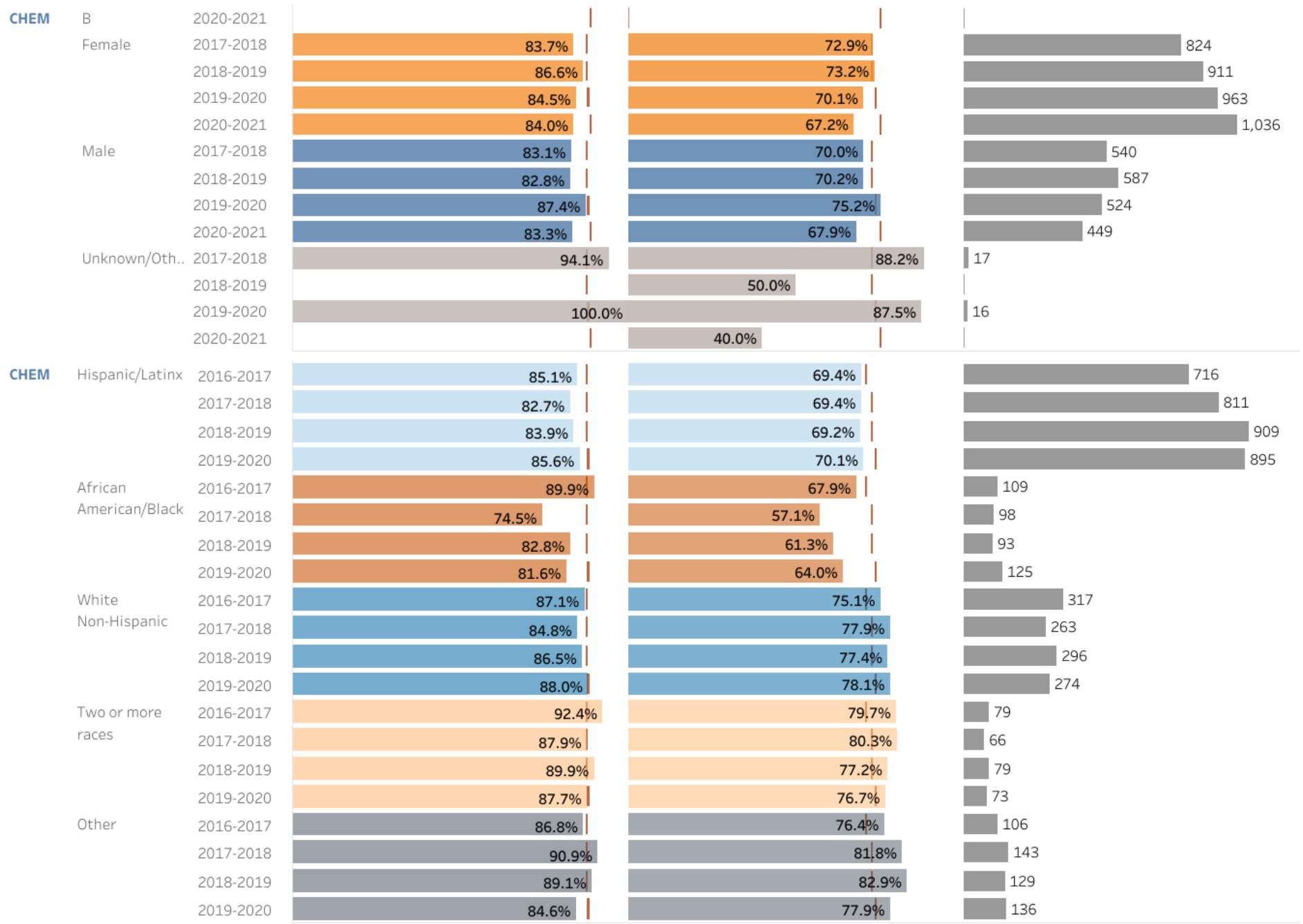
Number of Awards

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

	Fall 2017	Fall 2018	Fall 2019	Fall 2020
PT (Adjunct) FTEF	4.3	4.5	4.7	4.7
FT (Regular) FTEF	4.7	5.1	4.5	5.7
FT (Overload) FTEF	1.7	1.9	2.6	1.7
TOTAL FTEF	10.7	11.6	11.8	12.1
PT/FT FTEF Ratio	0.9	0.9	1.1	0.8
FTES	138.9	162.7	164.9	163.8
FTES/FTEF Ratio	13.0	14.0	14.0	13.5
WSCH/FTEF Ratio	390.6	420.7	419.2	406.1

Click here to see AVC's Program awards dashboard

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



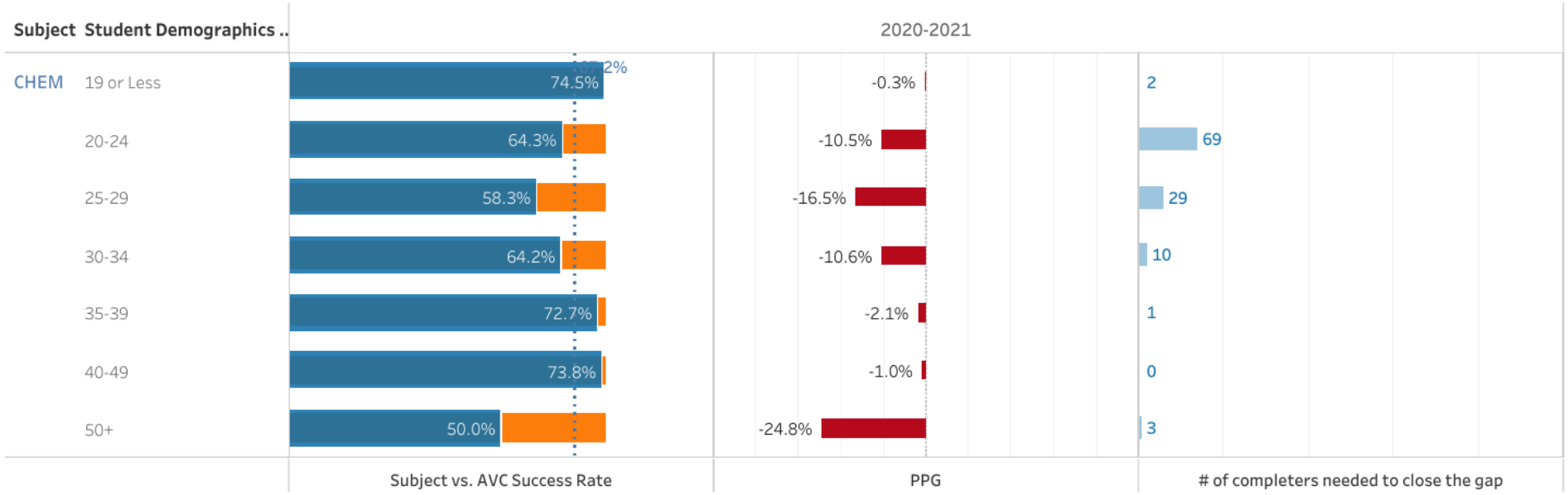
Select Demographics
Age Groups

Academic Year Slider

Click to Include EWs

2020-2021 Disproportionate Impact (DI) as Percentage Point Gap (PPG)

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



In 2020-2021, CHEM's Success Rate was 67.2% vs. AVC's Annual rate of 74.8%

Overall Disproportionate Impact as percentage point gap was : -7.6%

In CHEM, 1,496 was the enrollment count (duplicated headcount) (only shows if $n > 10$)

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

(For example, (1,496 * |-7.6%|)=114*. it means that 114 more successful course completers would help close the gap for this subject area)*

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

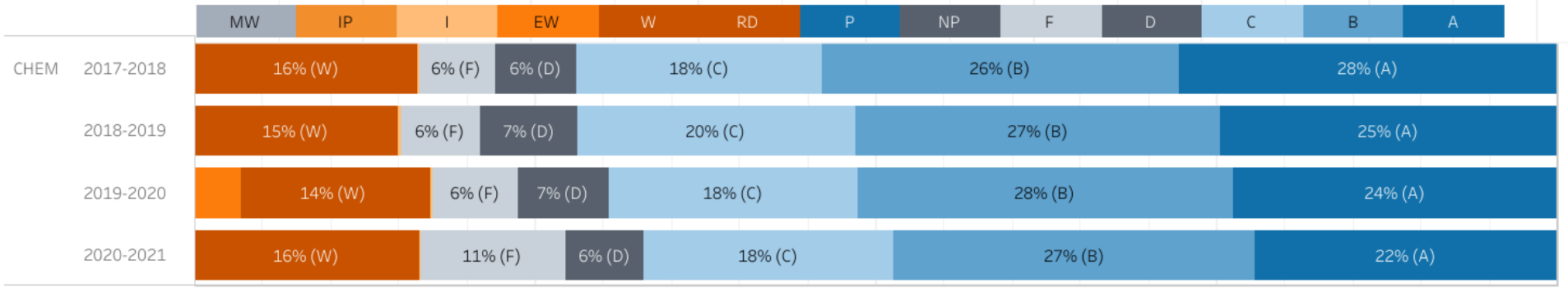
Some possible questions to ask when looking at the DI data:

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

Annual or Term Selector
Annual

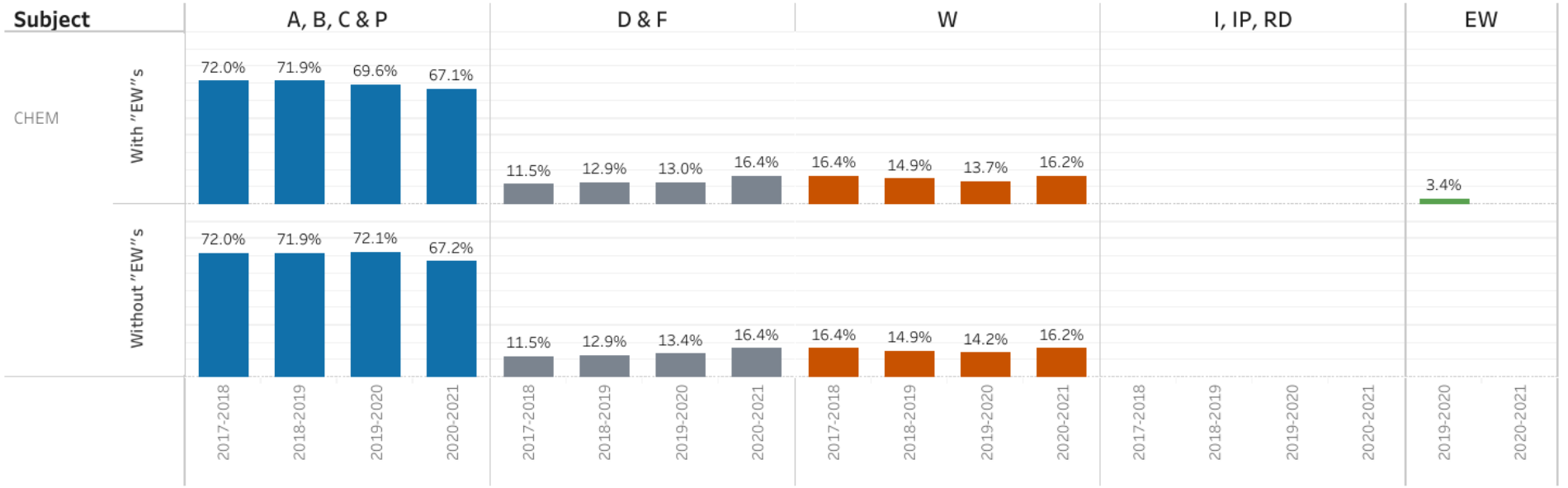
Term
All

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



CHEM (only shows if n >10)

Minor variation in numbers might occur due to rounding



ANTELOPE VALLEY COLLEGE

2022-2023 Program Review Report

Division/Area Name: MATH, SCIENCE and ENGINEERING/COMPUTER INFORMATION SCIENCE	**For Years: 2022-2023**
Name of person leading this review: RICHARD BIRITWUM	
Names of all participants in this review: Christos Valiotis (Dean), Alex Schroer (Dept. Chair)	

Part 1. Program Overview:

1.1.Briefly describe how the program contributes to the district mission

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

1.2. State briefly program highlights and accomplishments

The Computer Sciences Discipline has produced approximately **9.6**% (**303 of 3,150**) of AVC degrees and certificates awarded last academic year. As a small discipline in terms of number of full-time faculty and adjunct Instructors, we continue to meet the needs of our community and students by professionally helping them move forward in their career and educational objectives. We continue to do outreach in the local high schools, Churches and College fairs and attract the excellent, high-achieving students into the Computer Information Science discipline as data reflecting the potential earning power that could be achieved in the long term in computer software development continues to skyrocket.

1.3. Check each Institutional Learning Outcome (ILO) supported by the program. *Type an "X" if checkbox is unavailable.*

☒ **Communication**	☒ Demonstrates analytical reading and writing skills including research, quantitative and qualitative evaluation and synthesis. ☒ Demonstrates listening and speaking skills that result in focused and coherent communications
☒ **Creative, Critical, and Analytical Thinking**	☒ Uses intellectual curiosity, judgment and analytical decision-making in the acquisition, integration and application of knowledge and skills. ☒ Solves problems utilizing technology, quantitative and qualitative information and mathematical concepts.
☒ **Community/Global Consciousness**	☒ Understands and applies personal concepts of integrity, ethics, self-esteem, lifelong learning, while contributing to the well-being and the environment. ☒ Demonstrates an awareness and respect of the values of diversity, complexity, aesthetics and varied cultural expressions.

☒ **Career and Specialized Knowledge** ☒ Demonstrates knowledge, skills and abilities related to student educational goals, including career, transfer and personal enrichment.

***1.4. Check each** Educational Master Plan (EMP)/Strategic Plan Goal **supported by the program.** Type an "X" if checkbox is unavailable.*

☒ **Goal 1*:** Commitment to strengthening institutional effectiveness measures and practices.
☒ **Goal 2*:** Increase efficient and effective use of resources: Technology; Facilities; Human Resources; Business Services.
☒ **Goal 3:** Focus on utilizing proven instructional strategies that will foster transferable intellectual skills.
☐ **Goal 4*:** Advance more students to college-level coursework—Develop and implement effective placement tools.
☒ **Goal 5:** Align instructional programs to the skills identified by the labor market.
*Indicates College-Wide Priorities for 2021-2022

Part 2.A. Please provide the results of any internal and external environmental scan information you have gathered related to the program e.g. surveys, interviews, focus groups, advisory groups, licensure exam scores, job placement, State mandates, etc.:

According to EDD labor market information (LMI), the occupational projections for computer software developers, computer science professionals' shows growth of over 16.5% (16%) over the period 2014-2024. Due to Pandemic, no Advisory Committee meeting for CS/CIS was held.
On the external front, AVC's CIS transfer graduates from UCs and CSUs that we monitored, had a 78% graduation rate and had secured employment in software development in northern and southern California regions.

Part 2.B. Analyze the program review data (please see the program review data retrieval instructions and attach your program review data page with any other supporting documents), the above environmental scan information, and anything else related to your area to identify the program strengths, weaknesses, opportunities, & threats (SWOT):

Strengths	CIS average retention rate was still high, but lower than previous cycle as a result of the pandemic and Hyflex modality that students had difficulty adapting to.
Weaknesses	Despite lower completions, our CIS discipline still compares favorably with other CCCs our region. The pandemic forced full time, daytime students to adapt to online coursework, but a large number of students were unable to keep up with the rigidity of hands-on computer programming at home and dropped from classes altogether. Lower enrollment completion numbers reflect this situation.
Opportunities	With the Hyflex modality of all coursework here to stay during this cycle, CIS faculty will need to encourage and stress the need for completion of degree goals by students and with the help of academic community such as Counseling and Articulation.
Threats	With the coronavirus pandemic still raging, and with high numbers of students not vaccinated, students juggling jobs with classes and the lack of hands-on programming with classroom interactions, teamwork and collaborations and lack of face-to-face Instruction and low appearance at the Learning center, lack of consulting with student tutors, may present long term challenges with graduation rates.

Part 2.C. Review and comment on progress towards SLO/PLO/OO Action Plans:

Despite continued high enrollment, academic progress made in this time period has been lower than expected, due to the ongoing coronavirus pandemic, and the emphasis on a Hyflex modality of instruction. CS/CIS students have been slow to adapt to this modality. The implementation of Computer LAB infrastructure has not been adequate to provide a full interactive academic environment for our students. Online students do not interact very effectively with classroom students, due to the lack of adequate microphones in the CIS LABS.

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

Past program review had consistently requested a second F/T faculty for CIS/CS to assist with increased enrollment, retention and graduation. The request continues to be made for new classroom resources every year to help strengthen the Hyflex modality.

Part 3. Based on Part 2 above, please list program/area goals for 2020-2021:

Program/Area Goal #	*Goal supports which ILO/PLO/SLO/OO?*	*Description of Goal*	*Steps to be taken to achieve goal?*
#1. Personnel	ILO #2, ILO #4, CIS PLO Action Plan #1	Increase CIS degree completions.	Updated Action Plan reflected increasing focus on working with Counselors, and other academic groups to help promote our program, and pursue articulation efforts with UCs and CSUs. Obtaining a second F/T will go a long way to promote this goal.
#2. Classroom Technology & Resources	ILO #4, 3, 2, 1	Increase the success of CIS coursework by emphasizing on hands-on programming LAB sections.	We need to develop the current Labs with interactive whiteboards, AV equipment to enhance the new HYFLEX modality to suite a CIS coursework. Expand computer labs to second floor of MH building to free up 3rd Floor labs for CIS courses.
#3 Marketing and Outreach	ILO #4,	Expand awareness of CIS program to attract jobs for CIS certificate holders. Promote new CS program with local High Schools, and transfers from other CCCs.	Continue providing administrative support with advertising materials, fliers, pamphlets, newspaper and magazine advertisements and handouts. Create powerful webpages for CIS/CS programs, and maintain web updates with new content, such as approved new courses.
#4. Improvement of student success and retention.	EMP Goal #3, CIS PLO Goal #4	Examine new approaches to hire a second F/T and Adjunct faculties	Outreach to software engineers at Edwards AFB, Northrup

	to support and improve our curriculum. Focus on classroom success, and maintain student retention in our courses, despite the ongoing pandemic.	Grumman, Lockheed Martin, Boeing, Virgin Galactica to apply for Adjunct positions.	

Part 4. Resource Requests that Support Program Needs (Based on above analyses and listed in priority order):

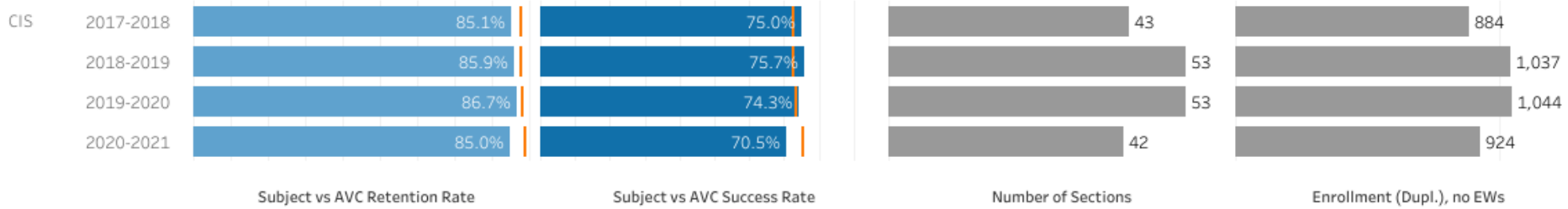
Type of Resource Request	*Summary of Request*	*New or Repeat Request*	*Amount of Request, $*	*One-Time or Recurring Cost, $*	*Contact's Name*
Faculty	Hire second F/T Instructor of CIS program	Repeat	$150, 000	Recurring	Richard Biritwum
Classified Staff	N/A	N/A	N/A	N/A	N/A
Technology	More updated computers, Audio-video components including Whiteboards to enhance Hyflex.	Repeat	$150,000	One-Time	Richard Biritwum
Physical/Facilities	Updated computer lab furniture	Repeat	$5,000	One-Time	Richard Biritwum
Supplies	Consumables for Lab software and hardware.	Repeat	$5,000	Recurring	Richard Biritwum
Professional Development	CIS Advisory Council	Recurring	$2,000	Recurring	Richard Biritwum
Other	N/A				

Part 5. Insert your Program Review Data here, as well as any other supporting data. (See Part 2.B above.)

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

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

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



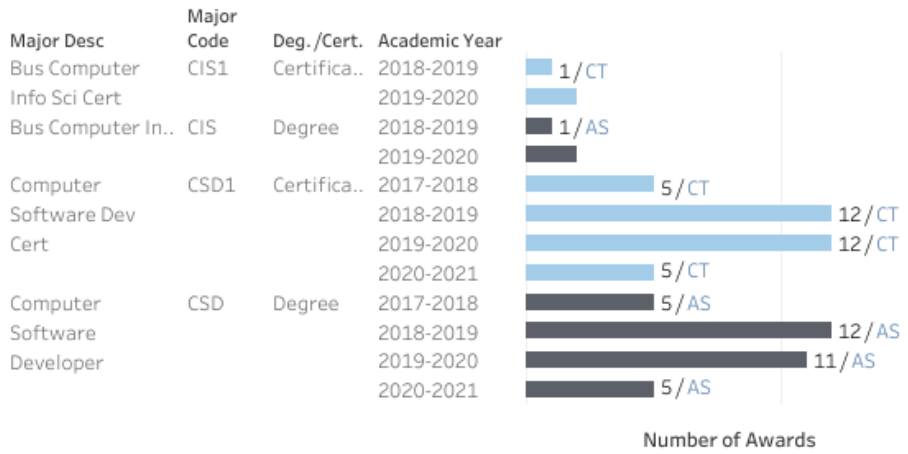
Enrollment and Number of Sections by *Modality* in CIS

	Instr. Method	2017-2018	2018-2019	2019-2020	2020-2021
Number of Sections	Online	5	4	7	6
	Other Indep Study		5	3	
	Traditional	38	44	43	36
Enrollment	Online	93	100	151	136
	Other Indep Study		5	3	
	Traditional	791	932	926	788

Enrollment and Number of Sections by *Location* in CIS

	Location	2017-2018	2018-2019	2019-2020	2020-2021
Number of Sections	Lancaster	37	46	44	33
	Palmdale	6	7	9	9
Enrollment	Lancaster	762	871	870	722
	Palmdale	122	166	210	202

Number of Degrees/Certificates Awarded in AS-T Computer Science (COSC), Bus Computer Info Sci Cert (CIS1), Bus Computer Info Science (CIS) and 2 more



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

	Fall 2017	Fall 2018	Fall 2019	Fall 2020
PT (Adjunct) FTEF	3.2	4.2	3.5	2.9
FT (Regular) FTEF	1.6	1.3	1.9	2.1
FT (Overload) FTEF	0.3	0.3	0.7	0.8
TOTAL FTEF	5.0	5.8	6.1	5.8
PT/FT FTEF Ratio	2.0	3.2	1.9	1.4
FTES	48.3	62.0	62.5	58.9
FTES/FTEF Ratio	9.7	10.7	10.3	10.1
WSCH/FTEF Ratio	289.5	320.7	308.9	304.4

Click here
to see AVC's Program
awards dashboard

ANTELOPE VALLEY COLLEGE

2020-2021 Program Review Report

Division/Area Name: Math, Science, and Engineering Division - Engineering Department	**For Planning Years: 2022-2023**
Name of person leading this review: Jonathan Compton (Faculty)	
Names of all participants in this review: Christos Valiotis (Dean), Alex Schroer (Chair)	

Part 1. Program Overview:

1.1.Briefly describe how the program contributes to the district mission

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

AVC Engineering								
	Enrollment by Sex				% of Total			
	2017-2018	2018-2019	2019-2020	2020-2021	2017-2018	2018-2019	2019-2020	2020-2021
Female	80	77	96	106	21.1%	23.1%	18.3%	21.3%
Male	287	257	417	392	75.7%	76.9%	79.6%	78.7%
Unknown	12	0	11	0	3.2%	0.0%	2.1%	0.0%
Total	379	334	524	498				
	Enrollment by Race/Ethnicity				**% of Total**			
	2017-2018	**2018-2019**	**2019-2020**	**2020-2021**	**2017-2018**	**2018-2019**	**2019-2020**	**2020-2021**
Hispanic/Latinx	207	193	320	316	55.5%	58.1%	61.1%	63.1%
African American	0	0	16	23	0.0%	0.0%	3.1%	4.6%
White	103	77	125	102	27.6%	23.2%	23.9%	20.4%
Two or More	29	17	18	23	7.8%	5.1%	3.4%	4.6%
Other	34	45	45	37	9.1%	13.6%	8.6%	7.4%
Total	373	332	524	501				

Hispanic enrollment has increased steadily between 17-18 and 19-20 (55% increase) representing now over 60% of total enrollment. Compared to the national average of 22% (2018 data published by NSF), AVC's Hispanic enrollment percentage, is almost 3 times as large. The program has also experienced a significant increase in female student enrollment between 17-18 and 19-20 (20%) representing now 20% of total enrollment. This is on par with the national enrollment of 21.9%. In 2018, the STEM program and particularly the engineering department was awarded a $3.75 million grant from US Department of Education under the Hispanic Serving Institutions program. Outreach efforts funded by the grant have resulted in significant gains towards diversity and equity for our underserved populations. However, we still need to do more to close the significant gap in enrollment for our African/American students.

1.2.State briefly program highlights and accomplishments

Our degree completions have increased by 425% since 2017-2018. This is mainly due to our degree pathways we started offering in 2018-2019. These offered more realistic and transferable degree pathways for students.

AVC Engineering								
	# of Engineering Degrees Awards by Discipline				% of Total			
	2017-2018	2018-2019	2019-2020	2020-2021	2017-2018	2018-2019	2019-2020	2020-2021
Computer Engr	N/A			1	N/A	0.0%	0.0%	4.8%
Electrical Engr	N/A	9	5	13	N/A	52.9%	33.3%	61.9%
ENGR	4	1	1	1	100.0%	5.9%	6.7%	4.8%
Mechanical Engr	N/A	7	9	6	N/A	41.2%	60.0%	28.6%
Total	4	17	15	21				
% Increase		325%	275%	425%				

We have also been able to strengthen our relationship with CSULB AV by bringing another lab class from their campus to ours, to utilize our facilities. We have also been able to recruit some of their students (former AVC graduates) and bring them in as tutors for our current students.

***1.3. Check each** Institutional Learning Outcome (ILO) **supported by the program.** Type an "X" if checkbox is unavailable.*

☐ **Communication**	☑ Demonstrates analytical reading and writing skills including research, quantitative and qualitative evaluation and synthesis. ☐ Demonstrates listening and speaking skills that result in focused and coherent communications
☐ **Creative, Critical, and Analytical Thinking**	☑ Uses intellectual curiosity, judgment and analytical decision-making in the acquisition, integration and application of knowledge and skills.

☑ Solves problems utilizing technology, quantitative and qualitative information and mathematical concepts.

☐ **Community/Global Consciousness** ☐ Understands and applies personal concepts of integrity, ethics, self-esteem, lifelong learning, while contributing to the well-being of society and the environment.

☑ Demonstrates an awareness and respect of the values of diversity, complexity, aesthetics and varied cultural expressions.

☐ **Career and Specialized Knowledge** ☑ Demonstrates knowledge, skills and abilities related to student educational goals, including career, transfer and personal enrichment.

***1.4. Check each** Educational Master Plan (EMP)/Strategic Plan Goal **supported by the program.** Type an "X" if checkbox is unavailable.*

☐ **Goal 1:** Commitment to strengthening institutional effectiveness measures and practices.

☑ **Goal 2:** Increase efficient and effective use of resources: Technology; Facilities; Human Resources; Business Services.

☑ **Goal 3:** Focus on utilizing proven instructional strategies that will foster transferable intellectual skills.

☑ **Goal 4:** Advance more students to college-level coursework-Develop and implement effective placement tools.

☐ **Goal 5:** Align instructional programs to the skills identified by the labor market.

Part 2.A. Please provide the results of any internal and external environmental scan information you have gathered related to the program e.g. surveys, interviews, focus groups, advisory groups, licensure exam scores, job placement, State mandates, etc.:

On an annual basis, we monitor graduation data from the local Engineering program administered by CSU Long Beach. Since 2012, the program has graduated approximately 200 students more than 75% of whom are AVC transfers. As of December 2020, 90% of those students have secured employment before graduation if sought. Detailed data for the cohorts starting in 2016 are presented below

AV Engineering Program- Cal State Long Beach

Enrollment Data (2016- 2020)

	2016			2017			2018			2019			2020		
	EE	ME	Totals	EE	ME	Totals	EE	ME	Totals	EE	ME	Totals	EE	ME	Totals
Total Accepted	17	19	36	12	19	31	15	26	41	14	15	29	10	16	26
AVC Transfers	14	14	28	9	16	25	11	21	32	13	11	13	8	14	22
Total Graduated	12	13	25	9	12	21	13	20	33						
AVC Graduates	8	7	15	8	9	17	9	17	26						

Part 2.B. Analyze the program review data (please see the program review data retrieval instructions and attach your program review data page with any other supporting documents), the above environmental scan information, and anything else related to your area to identify the program strengths, weaknesses, opportunities, & threats (SWOT):

Strengths	Our average retention (>90%) and average success rates (~80%) are very good for such a difficult major
Weaknesses	Even with the increase of completions, we are still lacking compare to the number of students transferring
Opportunities	We will continue to stress the importance of degree completion with students and counselors
Threats	Our current threats stem from the pandemic lockdown. Many of our students acquired jobs and are now trying to juggle work life with a high unit, high intensity major. We are also facing the reality that students coming into our labs have not performed hands on labs before due to the pandemic.

Part 2.C. Review and comment on progress towards SLO/PLO/OO Outcomes Analysis (fka Action Plans):

We can see evidence in our SLO data as well as the feedback from students that we can benefit the following

SLO – We have been approved for a second full time faculty member which will hopefully help with our electrical engineering based courses (ENGR 185 and ENGR 230). These courses have been passed around from adjunct to adjunct for a while and need a permanent professor to take them on. This will help with a consistent curriculum and expectations. Unfortunately, trying to find another engineer to take a huge pay cut to come teach has been quite challenging.

PLO – Appropriate lab for engineering – We do not have a formal engineering lab to this date. We have a shared lecture/lab space that is not suitable for lab instruction. We have acquired an new space, along with our current to house our labs, but we will need to fully renovate these rooms to accommodate our engineering hardware (mechanical and electrical).

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

Goal 1 - We have definitely had an increase in degree completions (425%) due to our implementation of the degree pathways to support specific engineering disciplines. This change is from four completions in 2017-2018 up to the now 21 completions in 2020-2021. However, with the now >500 students declaring an engineering discipline as their major we clearly have more room to improve.

Goal 2 – We are still struggling with this goal since our lab is still a shared space for lecture and not a true lab space. We have acquired additional space to hopefully complete a true lab space for our students to succeed in lab, but the pandemic has postponed the renovation and completion of these new lab spaces. We have received help from the lab tech position for our lab courses. This has been extremely helpful to setup and maintain equipment for our complicated lab schedule.

Part 3. Based on Part 2 above, please list program/area goals for 2021-2022:

Program/Area Goal #	*Goal supports which ILO/PLO/SLO/OO?*	*Description of Goal*	*Steps to be taken to achieve goal?*
#1	ILO : 7	Increase engineering degree completions	We will continue to work with counseling and our students to make them aware of the degree program as well as continue increasing our articulation with universities to ensure all of our courses count. We hope to acquire a second faculty member to help develop a more consistent schedule to help our students' complete degrees in a timely manner. I am currently an integral part of the C-ID program for ENGR and as such I am expected to attend our bi-annual CAELC meetings held throughout the state. These meetings help standardize curriculum across the state which helps with articulation for us.
#2	ILO: 1, 3, 4, 6, 7	Increase the success of our courses that contain hands on lab sections	We need to develop the new space acquired to suite a mechanical engineering lab as well as transform our current space into an electrical engineering lab. These will support the following lab courses (ENGR 130, ENGR 185, and ENGR 230) as well as potentially PHYS and CSULB AV. This will include renovating the rooms to handle the electrical and mechanical devices needed to run these labs as well as proper lab benches for both to ensure safety for students.

#3

Part 4. Resource Requests that Support Program Needs (Based on above analyses and listed in priority order):

Type of Resource Request	*Summary of Request*	*New or Repeat Request*	*Amount of Request, $*	*One-Time or Recurring Cost, $*	*Contact's Name*
Faculty	Second faculty member	Repeat	$100,000 (Salary and benefits)	Recurring	Jonathan Compton
Classified Staff					
Technology	Lab equipment to duplicate what is there, to be able to actually complete a lab within a given class period instead of 2 or 3, due to lack of equipment	Repeat	$100,000	One-Time	Jonathan Compton
Physical/Facilities	Lab benches and chairs to support a mechanical engineering lab. Lab benches and chairs to support an electrical engineering lab.	Repeat	$60,000	One-Time	Jonathan Compton
Supplies	Consumables for the Engineering labs	Repeat	$1,000	Recurring	Jonathan Compton
Professional Development	California Engineering Liaison Council bi-annual meetings	Repeat	$1,500	Recurring	Jonathan Compton
Other					

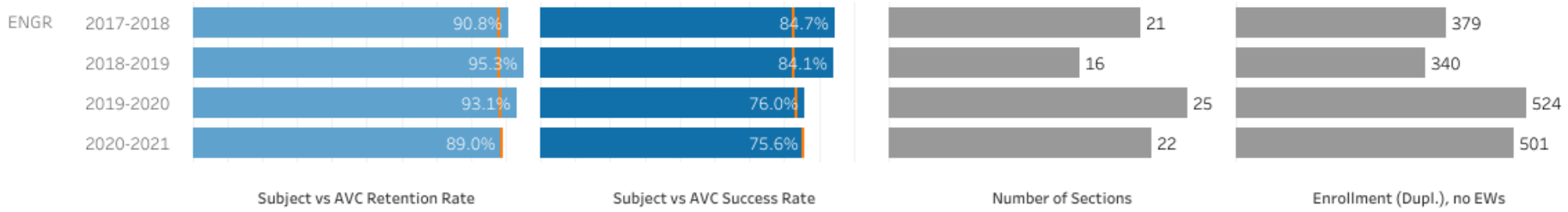
****REQUIRED: After gathering the information above, fill out your RESOURCE REQUESTS to be shared with the Budget Committee: https://www.surveymonkey.com/r/20-21ProgramReview**

Part 5. Insert your Program Review Data here, as well as any other supporting data. (See Part 2.B above.)

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

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

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



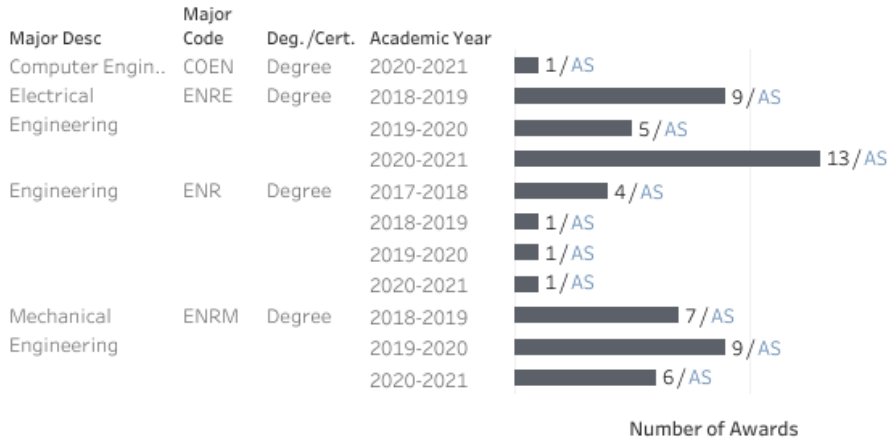
Enrollment and Number of Sections by *Modality* in ENGR

	Instr. Method	2017-2018	2018-2019	2019-2020	2020-2021
Number of Sections	Online			5	7
	Other Indep Study			1	1
	Traditional	21	16	19	14
Enrollment	Online			109	176
	Other Indep Study			1	1
	Traditional	379	340	428	324

Enrollment and Number of Sections by *Location* in ENGR

	Location	2017-2018	2018-2019	2019-2020	2020-2021
Number of Sections	Lancaster	21	16	25	21
	Palmdale				1
Enrollment	Lancaster	379	340	538	475
	Palmdale				26

Number of Degrees/Certificates Awarded in Computer Engineering (COEN), Electrical Engineering (ENRE), Engineering (ENR) and 1 more

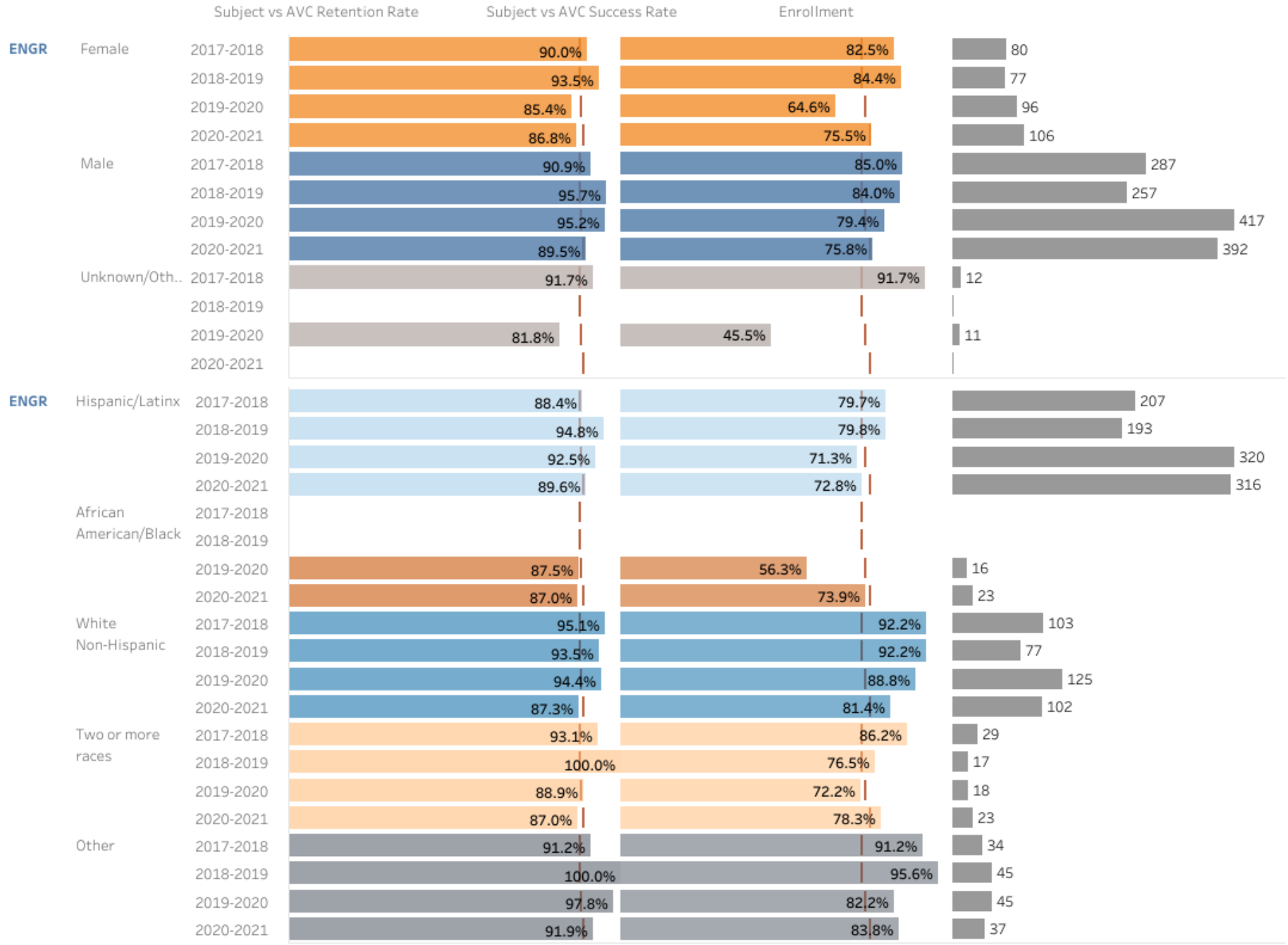


FTEF by Contract Type, Part-time/Full-time Ratio, FTES, FTES/FTEF in ENGR

	Fall 2017	Fall 2018	Fall 2019	Fall 2020
PT (Adjunct) FTEF	1.0	0.5	1.1	1.1
FT (Regular) FTEF	1.5	1.1	1.2	1.0
FT (Overload) FTEF	0.3		0.7	0.9
TOTAL FTEF	2.8	1.7	2.9	3.0
PT/FT FTEF Ratio	0.7	0.5	0.9	1.1
FTES	28.3	20.2	33.3	32.4
FTES/FTEF Ratio	10.2	12.1	11.5	10.8
WSCH/FTEF Ratio	307.1	362.9	344.9	323.9

Click here to see AVC's Program awards dashboard

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



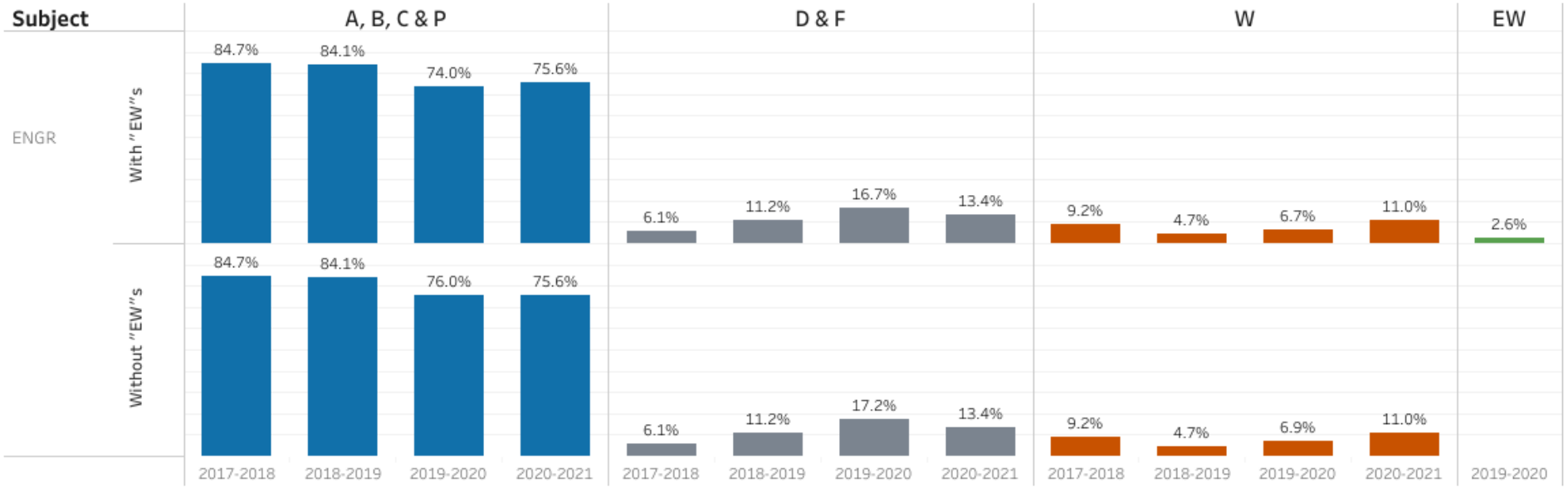
Annual or Term Selector
Annual

Term
All

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

ENGR (only shows if n >10)

Minor variation in numbers might occur due to rounding



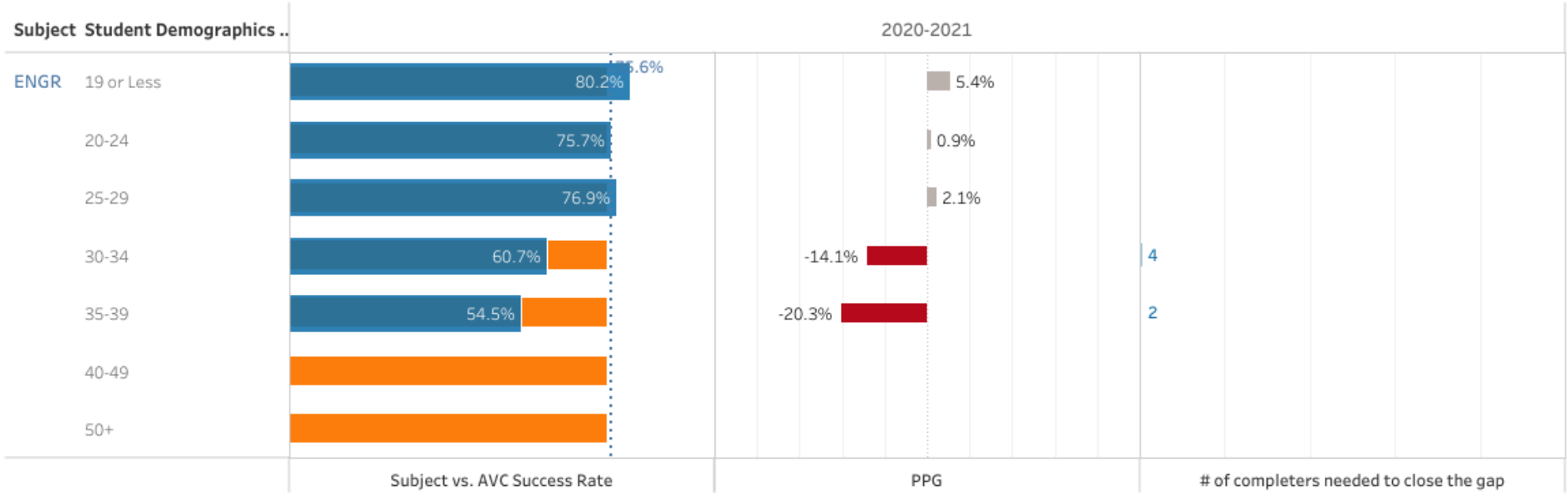
Select Demographics
Age Groups

Academic Year Slider

Click to Include EWs

2020-2021 Disproportionate Impact (DI) as Percentage Point Gap (PPG)

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



In 2020-2021, ENGR's Success Rate was 75.6% vs. AVC's Annual rate of 74.8%

Overall Disproportionate Impact as percentage point gap was : 0.8%

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

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

(For example, (501 * |0.8%|)=4. *it means that 4 more successful course completers would help close the gap for this subject area)*

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

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

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

ANTELOPE VALLEY COLLEGE

2020-2021 Program Review Report

Division/Area Name: Geosciences (GEOL/GEOG/ERSC)	**For Planning Years: 2022-2023**
Name of person leading this review: Dr. Mike Pesses	
Names of all participants in this review: Dr. Aurora Burd, Paul Stahmann	

Part 1. Program Overview:

1.1.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.

1.2.State briefly program highlights and accomplishments

We think getting through the forced remote learning from COVID-19 was certainly a highlight. This year also saw the creation of the Geology Club, which has been meeting and encouraging more student participation within the department. Despite the challenges of remote instruction, multiple students made it through our programs and are now doing quite well at institutions like CSUN.

***1.3. Check each** Institutional Learning Outcome (ILO) **supported by the program.** Type an "X" if checkbox is unavailable.*

X **Communication**	X Demonstrates analytical reading and writing skills including research, quantitative and qualitative evaluation and synthesis. ☐ Demonstrates listening and speaking skills that result in focused and coherent communications
X **Creative, Critical, and Analytical Thinking**	X Uses intellectual curiosity, judgment and analytical decision-making in the acquisition, integration and application of knowledge and skills. X Solves problems utilizing technology, quantitative and qualitative information and mathematical concepts.
X **Community/Global Consciousness**	X Understands and applies personal concepts of integrity, ethics, self-esteem, lifelong learning, while contributing to the well-being of society and the environment.

	X Demonstrates an awareness and respect of the values of diversity, complexity, aesthetics and varied cultural expressions.
X **Career and Specialized Knowledge**	X Demonstrates knowledge, skills and abilities related to student educational goals, including career, transfer and personal enrichment.

***1.4. Check each** Educational Master Plan (EMP)/Strategic Plan Goal **supported by the program.** Type an "X" if checkbox is unavailable.*

☐ **Goal 1:** Commitment to strengthening institutional effectiveness measures and practices.

☐ **Goal 2:** Increase efficient and effective use of resources: Technology; Facilities; Human Resources; Business Services.

X **Goal 3:** Focus on utilizing proven instructional strategies that will foster transferable intellectual skills.

☐ **Goal 4:** Advance more students to college-level coursework-Develop and implement effective placement tools.

X **Goal 5:** Align instructional programs to the skills identified by the labor market.

Part 2.A. Please provide the results of any internal and external environmental scan information you have gathered related to the program e.g. surveys, interviews, focus groups, advisory groups, licensure exam scores, job placement, State mandates, etc.:

In talking with a variety of industry professionals and other faculty in the geosciences, it is clear that we need to make the switch from ArcGIS Desktop to ArcGIS Pro for our students. The former is being phased out by ESRI and within the next year all transfer and job opportunities for our students will require a working knowledge of the new program. Our current software license should provide us access to the new program; hopefully this will simply be a matter of ITS being able to make the switch.

Part 2.B. Analyze the program review data (please see the program review data retrieval instructions and attach your program review data page with any other supporting documents), the above environmental scan information, and anything else related to your area to identify the program strengths, weaknesses, opportunities, & threats (SWOT):

Strengths Generally, our retention and success rates have been at or above the AVC averages for the past four years. The data have managed to be relatively consistent despite the unprecedented challenges we have faced. Also, students who do complete our programs, even though there are not many, consistently do well when they transfer to a four-year university.

Weaknesses While success rates were generally good, reviewing the data showed that our online rates were lower than traditional face-to-face classes. Clearly addressing deficiencies with our online teaching is a must. We also continue to have a small number of majors despite the tremendous job opportunities for students after college.

Despite full enrollment in most sections, classes were cut in ERSC 101 and GEOL 101 for Spring 2021 when one full-time faculty member sought a reduced workload for a single semester and the hiring process to find adjunct instructors didn't proceed smoothly. Loss of introductory courses may shrink the pipeline of students who could pursue a geoscience major.

Palmdale Center continues to attempt to offer geoscience classes, but not only are they regularly cancelled 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.

Opportunities As mentioned in our previous program review, both climate change and COVID-19 have shown a need for students studying the spatial awareness and technical skills that geosciences degrees give students. These subjects have been worked into the relevant courses we teach at AVC and will hopefully grab student interest in majoring in the field.

The AVC administrator who liaises with the California State Prison – Los Angeles County has repeatedly requested to offer ERSC 101 inside the prison (after ERSC 101 was offered during Summer 2019 with great success), but faculty have had to decline due to already having full workloads as well as logistics problems related to removing the lab supplies from the Palmdale Center and placing them temporarily at the prison.

Threats Fully remote teaching was a challenge but returning to campus also presented issues. Most of our classes were taught completely in person, but many students were quarantined for a variety of reasons, preventing them from coming to our classes. With no Zoom component of the class, it was quite difficult to ensure that students did not fall behind. This will likely continue to be an issue in at least the next semester or two.

Palmdale needs a full set of required supplies. Without this, classes in Palmdale will not be as successful (assuming they can even get enough enrollment to run).

Materials were removed from the main campus and Palmdale Center to support the labs at the prison, but this is not feasible during the semester or during summers where labs are offered on the main campus (the timeline of getting materials sent to prison, then released on parole is quite long and unpredictable). To teach geoscience courses regularly at the prison, the prison needs its own dedicated set of supplies.

Part 2.C. Review and comment on progress towards SLO/PLO/OO Outcomes Analysis (fka Action Plans):

Being thrust into remote learning exposed the many challenges of teaching online. One action plan for geosciences is to continue to develop our online offerings, both to prepare for future pandemics or other interruptions, as well as to give students more flexibility in completing their degrees. This is not to simply offer online courses, but to make sure that the courses are equitable with our face-to-face offerings. Faculty are currently completing coursework with the Online Network of Educators (@ONE) through the California Community Colleges to ensure that our courses meet state standards. Faculty have also taken the in-house training in distance education offered by AVC's DETC and GEOL 101 was offered in an asynchronous online format for the first time in Spring 2021.

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

We have done some outreach work, but not as much as we would have liked. Faculty attended a variety of virtual AVC tours and college information Zoom meetings for potential students. 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. One effort is to make our small GIS program fully online and comprised of 8-week courses in order to show students a clear pathway to a certificate.

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 lower enrollment, there has been no progress on this issue. We hope to acquire additional supplies this year.

Part 3. Based on Part 2 above, please list program/area goals for 2021-2022:

Program/Area Goal #	*Goal supports which ILO/PLO/SLO/OO?*	*Description of Goal*	*Steps to be taken to achieve goal?*
#1 Updating GIS Software	ILO 4	Switch Computers to ArcGIS Pro	Work with ITS to ensure computers get updated.
#2 Improving student access	ILO 4	Loading up GIS software in "STEM Center"	Work with ITS to ensure that software is installed on computers.
#3 Counseling Outreach	ILOs 1-4	Work with counseling to attract more students to our classes and programs. Ensure that GIS students have a clear pathway to graduation as well.	Meet with counseling to design brochures or other materials to inform students.
#4 Palmdale Supplies Acquisition	ILOs 1-4	Acquire duplicate materials for Palmdale Center so that all ERSC, GEOG, and GEOL labs can be run at that location 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.

Part 4. Resource Requests that Support Program Needs (Based on above analyses and listed in priority order):

Type of Resource Request	*Summary of Request*	*New or Repeat Request*	*Amount of Request, $*	*One-Time or Recurring Cost, $*	*Contact's Name*

Faculty					
Classified Staff					
Technology					
Physical/Facilities					
Supplies	USGS 7.5-minute and 15-minute topo maps, approximately 48 maps at $8 each plus $5 S&H (and tax); 2010 geologic map from CA Geologic Survey, 2 at $25 plus $8 S&H (and tax)	Repeat	Approximately $450	One-time	Dr. Aurora Burd
Professional Development					
Other					

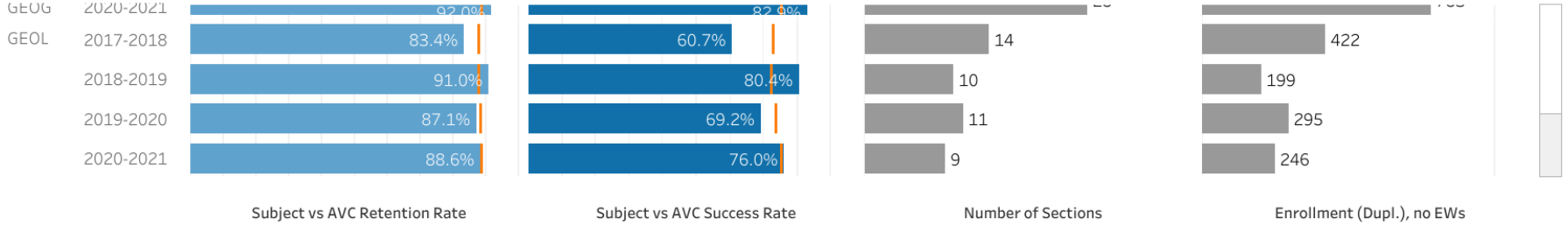
****REQUIRED: After gathering the information above, fill out your RESOURCE REQUESTS to be shared with the Budget Committee: https://www.surveymonkey.com/r/20-21ProgramReview**

Part 5. Insert your Program Review Data here, as well as any other supporting data. (See Part 2.B above.)

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

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

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



Enrollment and Number of Sections by *Modality* in All

	Instr. Method	2017-2018			2018-2019			2019-2020			2020-2021		
Number of Sections	Online		2			5			5			2	3
	Other Indep Study		1						1			2	
	Traditional	4	28	14	4	27	10	6	26	11	4	21	6
Enrollment	Online		58			#			#			59	80
	Other Indep Study		1						1			9	
	Traditional	78	#	#	79	#	#	#	#	#	#	#	#

Enrollment and Number of Sections by *Location* in All

	Location	2017-2018			2018-2019			2019-2020			2020-2021		
Number of Sections	Lancaster	4	26	12	4	26	10	5	26	9	4	21	4
	Lancaster ..							1					
	Palmdale		5	2		6			6	2		4	5
Enrollment	Lancaster	78	##	##	79	##	##	##	##	##	##	##	##
	Lancaster ..							22					
	Palmdale		75	42		##			##	56		##	##

Number of Degrees/Certificates Awarded in AA-T Geography (GEOT), AS-T Geology (GET), Geographic Info Systems LCert (GISX)

Major Desc	Major Code	Deg. /Cert.	Academic Year	
AA-T Geography	GEOT	Degree	2017-2018	4 / AA
			2018-2019	2 / AA
			2020-2021	4 / AA
AS-T Geology	GET	Degree	2019-2020	1 / AS
Geographic Info Systems LCert	GISX	Certifica..	2017-2018	1 / LC

Number of Awards

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

	Fal..	Fa..	Fal..	Fal..	Fa..	Fal..	Fal..	Fa..	Fal..	Fal..	Fa..	Fal..
PT (Adjunct) FTEF					1.1	0.9	0.7	0.7	0.2			
FT (Regular) FTEF	0.8	0.6	0.2	0.6	1.0	1.0	0.8	0.6	0.7	0.7	0.9	0.6
FT (Overload) FTEF		0.2	0.6	0.2		0.2	0.6	0.6	0.1		0.4	0.3
TOTAL FTEF	0.8	0.8	0.8	0.8	2.1	2.1	2.1	1.9	1.0	0.7	1.3	0.9
PT/FT FTEF Ratio	0.0	0.0	0.0	0.0	1.2	0.9	1.0	1.2	0.3	0.0	0.0	0.0
FTES	7.1	7.7	##	##	##	##	##	##	##	8.6	##	##
FTES/FTEF Ratio	8.8	9.6	##	##	##	##	##	##	##	##	##	##
WSCH/FTEF Ratio	##	##	##	##	##	##	##	##	##	##	##	##

Click here to see AVC's Program awards dashboard

ANTELOPE VALLEY COLLEGE

2020-2021 Program Review Report

Division/Area Name: Mathematics	For Planning Years: 2022-2023
Name of person leading this review: James Dorn	
Names of all participants in this review: James Dorn, Hal Huntsman	

Part 1. Program Overview:

1.1.Briefly describe how the program contributes to the district mission

The mathematics department is dedicated to providing 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.

1.2.State briefly program highlights and accomplishments

As AVC works to navigate the ever-changing educational environment due to state mandates brought forward as a result of the continuing pandemic, the mathematics department has done an excellent job transitioning to the changes in instructional modalities. The mathematics faculty professional development group, "Math Online Teaching", that was started early 2020, has continued to be a source of useful information regarding online pedagogy, especially with the switch to the HyFlex teaching model. As a result of reviewing the effects of the new placement models dictated by AB705 on student success, the department has started the process of creating co-requisite courses for Statistics and Trigonometry. It is hoped that these courses will provide students with the necessary prerequisite knowledge in order to be successful in these classes. We have been able to increase the number of SI and embedded tutors, both of which have been a great asset to the learning environment.

1.3. Check each Institutional Learning Outcome (ILO) supported by the program. *Type an "X" if checkbox is unavailable.*

X **Communication**	X Demonstrates analytical reading and writing skills including research, quantitative and qualitative evaluation and synthesis.
	☐ Demonstrates listening and speaking skills that result in focused and coherent communications
X **Creative, Critical, and Analytical Thinking**	X Uses intellectual curiosity, judgment and analytical decision-making in the acquisition, integration and application of knowledge and skills.
	X Solves problems utilizing technology, quantitative and qualitative information and mathematical concepts.

☐ **Community/Global Consciousness**	☐ Understands and applies personal concepts of integrity, ethics, self-esteem, lifelong learning, while contributing to the well-being of society and the environment. ☐ Demonstrates an awareness and respect of the values of diversity, complexity, aesthetics and varied cultural expressions.
X **Career and Specialized Knowledge**	X Demonstrates knowledge, skills and abilities related to student educational goals, including career, transfer and personal enrichment.

1.4. Check each Educational Master Plan (EMP)/Strategic Plan Goal supported by the program. *Type an "X" if checkbox is unavailable.*

X **Goal 1:** Commitment to strengthening institutional effectiveness measures and practices.
X **Goal 2:** Increase efficient and effective use of resources: Technology; Facilities; Human Resources; Business Services.
X **Goal 3:** Focus on utilizing proven instructional strategies that will foster transferable intellectual skills.
X **Goal 4:** Advance more students to college-level coursework-Develop and implement effective placement tools.
☐ **Goal 5:** Align instructional programs to the skills identified by the labor market.

Part 2.A. Please provide the results of any internal and external environmental scan information you have gathered related to the program e.g. surveys, interviews, focus groups, advisory groups, licensure exam scores, job placement, State mandates, etc.:

The shift to remote learning continues to create many challenges for the department, especially with regard to assessment and student engagement. This has been exacerbated with the inclusion of the HyFlex modality. The department continues to focus a significant amount of attention to instruction in the remote learning environment. Mathematics faculty continue to regularly discuss and present strategies to increase student engagement and success in remote instruction.

The placement process is an area of concern for the department, especially with regard to those entering the STEM pathway. The student placement in the STEM pathway shows that about 68% of the students would require some level of support, either recommended or strongly recommended. This provides an opportunity to put systems in place that can greatly increase the success rates for those students that are under-prepared. The department has begun the creation of co-requisite support classes that would provide those students with the prerequisite skills necessary to be successful in that pathway. These courses should be in place and available for students in the Fall 2022 semester.

Part 2.B. Analyze the program review data (please see the program review data retrieval instructions and attach your program review data page with any other supporting documents), the above environmental scan information, and anything else related to your area to identify the program strengths, weaknesses, opportunities, & threats (SWOT):

Strengths The success rates (see tables 1, 2 , 3 at the end of this document) for our entry transfer level math courses are relatively positive for those students that are placing into those classes not requiring support. This is confirmation that the placement models due to AB705 are where they should be.

Weaknesses The success rates (see tables 1, 2 , 3 at the end of this document) for our entry transfer level math courses are quite low, especially in the STEM pathway, for those students that are placing into those classes where support is recommended. This is a clear area to focus our attention on and work to increase the success for this subgroup of students.

Opportunities The creation of co-requisite support courses focusing on those students who require support has the potential to greatly increase success rates, not only for this subpopulation, but success rates overall.

Threats The number of sections of mathematics offered has been rapidly decreasing 61% since 2017-18. This was expected due to AB705 but the direct effects should have been realized in 2019-20. Certainly the pandemic has had negative effects on enrollment across the board and until we get back to some semblance of normality, particular remedies are difficult to ascertain.

Part 2.C. Review and comment on progress towards SLO/PLO/OO Outcomes Analysis (aka Action Plans):

The retention and success rates for 2020-2021 were 84.7% and 65.2% respectively. Both are marginally better than the previous year but still below AVCs average and below pre-pandemic levels. The effects of frequent changes to instructional modalities on success and retention continue to make drawing conclusions based on small changes in success rates difficult. Fall 2020 was the first semester in which almost all our courses were taught in synchronous online modality. Instructors experimented with many different approaches, based on the limited experience they had from the half in-person, half online semester in Spring 2020. In Spring 2021, instructors better understood the modality, but students continued to struggle because of poor WIFI connections, inadequate hardware, home environments that were not conducive to being in class, and other issues related to the change to online synchronous education.

The success rates for the department's two PLOs are listed below. Despite the challenges outlined above, in both cases, we were able to exceed the goal of 70%. As a result of reaching our target and the continuing evolution of the educational environment, the department has no planned changes but will continue to monitor student success rates in future semesters and make adjustments as appropriate.

PLO#1 (**PLO: Solve mathematical problems, including computational, real world, and proof, independently.)**: 71.5%

PLO#2 (**PLO: Effectively communicate solutions to mathematical problems using both words and mathematical symbols.):** 73.3%

Out of the 16 different courses that are taught in the department, all but four had overall success rates that exceeded the 70% goal. No changes are currently planned in these sections. The courses that had success rates below 70% are:

Math 102 (64.8%) Department opinions vary widely about the causes of this relative lack of success. Some argue that students who, prior to AB 705, would have been in Math 60 or Math 70 are causing the low success rate. Others suggest that, post-AB 705, the skills taught in Math 102 are relevant only for students pursuing a STEM discipline, and that those students are better served with corequisite support (see 2.B Opportunities), and that the department should be offering many less sections of Math 102. Only time and continued examination of the data will settle this debate.

Math 120 (45.7%) The small number of sections (2 per semester) makes the success rate dependent on factors that are hard to control. Small differences in grading structures, student preparedness, and other factors can have large effects on the success rate. It is also possible that we

are seeing a decline in the quality of students wanting to pursue elementary school teaching as a career, because the overall morale of teachers during the pandemic has dramatically declined.

Math 135 (63.2%) The low success rates in this class can be attributed to a general lack of prerequisite knowledge for certain demographics as a result of AB705. This was anticipated, as students are no longer to have successfully completed Math102 in order to enroll. The department is in the process of creating a co-requisite support class for students who place with a recommendation of support and is planned to be in place by Fall 2022. The inclusion of this course should go a long way in better preparing students to be successful in Math 135.

Math 220 (64.1%) The small number of sections (2 per semester) makes the success rate dependent on factors that are hard to control. Small differences in grading structures, student preparedness, and other factors can have large effects on the success rate.

There continues to be a few courses in which there was a large amount of variation in success rates on SLOs between sections of classes. The department has planned a training to revisit the SLO assessment process, rubric scoring, and SLO problem choice and is hopeful that this will help with consistency of assessment results.

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

Goal #1: To develop more techniques for teaching in a remote environment.

Goal #2: To provide online support to increase student success.

The department continues to hold regular faculty professional development meetings to collaborate on new and successful online pedagogy. All math faculty have access to the dedicated online teaching Canvas shell that houses all of the materials and strategies discussed.

Goal #3: To determine the effectiveness of current support mechanisms as pertains to students that have been identified as recommended support.

Though the success rates for those students that have attended the course specific workshops offered by faculty is unknown, the lack of this data is immaterial due to the average attendance of these workshops being 1.2 students per session. It is obvious to the department that with the extremely low participation numbers, a more effective means of support for students must be explored. The department continues to offer workshops on a limited basis until additional avenues of student support, such as co-requisite support courses, can be implemented.

Part 3. Based on Part 2 above, please list program/area goals for 2021-2022:

Program/Area Goal #	***Goal supports which ILO/PLO/SLO/OO?***	***Description of Goal***	***Steps to be taken to achieve goal?***
#1	ILO: 1, 2, 4 PLO: 1, 2	Increase Math135 and Math115 success rates for those students who	Create co-requisite support courses to help with just-in-time remediation of prerequisite topics.

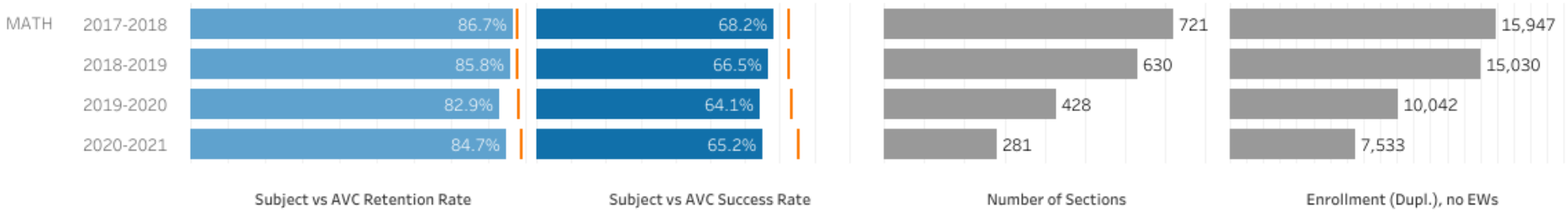
	SLO: 1, 2	place with support recommended or strongly recommended.	
#2	ILO: 1, 2 PLO: 1, 2 SLO: 1, 2	Increase the consistency of success rates between sections of courses, especially for those which have an overall success rate lower than the target 70%.	Initiate a discussion of the variation in success rates by section. Course leads facilitate a discussion among instructors about the level of the course and develop a document with example problems. Hold grade norming discussions.
#3	ILO: 1, 2, 3, 4 PLO: 1, 2 SLO: 1, 2	Explore an alternate STEM pathway to better prepare students who do not directly place into Math140.	Form a subcommittee to investigate the creation of a Math130, Math135 pathway to Calculus, identify potential benefits and challenges, present the findings to the department for a vote, and submit all required curricula to AP&P as to be considered for a Fall 2023 start date.

Part 4. Resource Requests that Support Program Needs (Based on above analyses and listed in priority order):

Type of Resource Request	*Summary of Request*	*New or Repeat Request*	*Amount of Request, $*	*One-Time or Recurring Cost, $*	*Contact's Name*
Faculty	Replacement of Instructor	Repeat	$100,000	Recurring	Christos Valiotis
Classified Staff	N/A				
Technology	Touchscreen laptops/tablets with stylus for faculty and students to teach remotely	Repeat	$6000-$10,000	One-time	Alex Parisky/James Dorn
Physical/Facilities	Computer Lab (ME going away)	New	TBD	One-time	Christos Valiotis
	Dedicated rooms (HyFlex capable)	New	TBD	One-time	
Supplies	More white board pens	New	TBD	Recurring	Christos Valiotis
Professional Development					
Other	Math Tutors	Repeat	TBD	Recurring	James Dorn

****REQUIRED: After gathering the information above, fill out your RESOURCE REQUESTS to be shared with the Budget Committee: https://www.surveymonkey.com/r/20-21ProgramReview**

Part 5. Insert your Program Review Data here, as well as any other supporting data. (See Part 2.B above.)



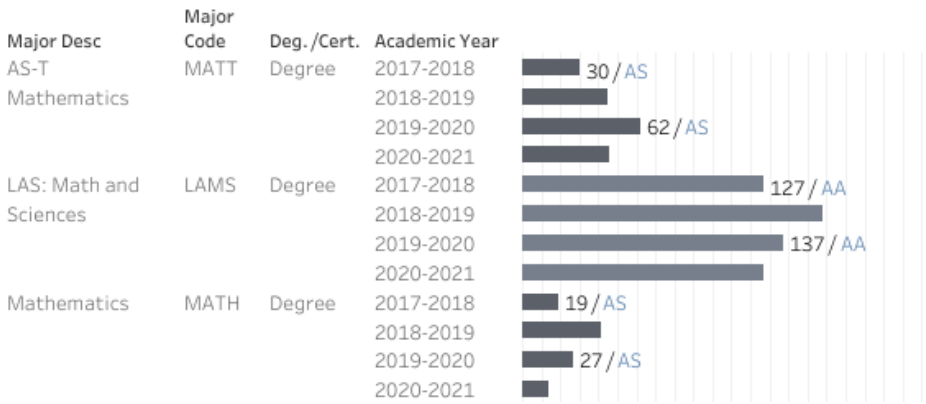
Enrollment and Number of Sections by ***Modality*** in MATH

	Instr. Method	2017-2018	2018-2019	2019-2020	2020-2021
Number of Sections	Online	26	24	3	2
	Other Indep Study	4	4		
	Traditional	691	602	425	279
Enrollment	Online	894	815	81	59
	Other Indep Study	8	4		
	Traditional	15,045	14,212	10,286	7,485

Enrollment and Number of Sections by ***Location*** in MATH

	Location	2017-2018	2018-2019	2019-2020	2020-2021
Number of Sections	Lancaster	671	568	361	246
	Lancaster [Off Ca..	6	6	12	9
	Palmdale	44	56	53	24
	Palmdale [Off Ca..			2	2
Enrollment	Lancaster	14,499	13,154	8,593	6,472
	Lancaster [Off Ca..	158	137	288	244
	Palmdale	1,290	1,740	1,432	765
	Palmdale [Off Ca..			54	63

Number of Degrees/Certificates Awarded in AS-T Mathematics (MATT), LAS: Math and Sciences (LAMS), Mathematics (MATH)



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

	Fall 2017	Fall 2018	Fall 2019	Fall 2020
PT (Adjunct) FTEF	18.0	16.3	11.9	9.7
FT (Regular) FTEF	21.9	20.3	22.2	21.2
FT (Overload) FTEF	3.4	4.0	2.6	1.1
TOTAL FTEF	43.2	40.6	36.6	32.0
PT/FT FTEF Ratio	0.8	0.8	0.5	0.5
FTES	704.8	667.0	571.3	448.9
FTES/FTEF Ratio	16.3	16.4	15.6	14.0
WSCH/FTEF Ratio	489.0	492.7	468.3	420.8

Table 1. Success Rates of Students taking MATH 102 in Fall 2020 and Spring 2021 by MMS Score

Course	MMS Recommendation	Fall 2020			Spring 2021			Fall 2020 + Spring 2021		
		Total Attempted (% Enrolled)	Successfully Passed Course	% Passed	Total Attempted (% Enrolled)	Successfully Passed Course	% Passed	Total Attempted (% Enrolled)	Successfully Passed Course	% Passed
MATH 102	See Counselor	10 (2%)	8	80%	5 (1%)	5	100%	15 (2%)	13	87%
	Support Strongly Recommended	113 (18%)	57	50%	69 (19%)	28	41%	182 (19%)	85	47%
	Support Recommended	154 (25%)	68	44%	89 (25%)	37	42%	243 (25%)	105	43%
	No Support Recommended	285 (46%)	162	57%	163 (45%)	81	50%	448 (46%)	243	54%
	No Score Available	62 (10%)	37	60%	33 (9%)	17	52%	95 (10%)	54	57%
Grand Total		**624 (100%)**	**332**	**53%**	**359 (100%)**	**168**	**47%**	**983 (100%)**	**500**	**51%**

Table 2: Success Rates of Students taking Non-STEM Math Courses in Fall 2020 and Spring 2021 by MMS Score

Course	MMS Recommendation	Fall 2020			Spring 2021			Fall 2020 + Spring 2021		
		Total Attempted (% Enrolled)	Successfully Passed Course	% Passed	Total Attempted (% Enrolled)	Successfully Passed Course	% Passed	Total Attempted (% Enrolled)	Successfully Passed Course	% Passed
MATH 110	See Counselor	- (0.5%)	-	100%	- (1%)	-	50%	- (1%)	-	67%
	Support Strongly Recommended	20 (9%)	9	45%	21 (10%)	12	57%	41 (10%)	21	51%
	Support Recommended	45 (21%)	27	60%	29 (14%)	22	76%	74 (18%)	49	66%
	No Support Recommended	97 (45%)	60	62%	92 (45%)	62	67%	189 (45%)	122	65%
	No Score Available	51 (24%)	41	80%	59 (29%)	36	61%	110 (26%)	77	70%
	Total	**214 (100%)**	**138**	**64%**	**203 (100%)**	**133**	**66%**	**417 (100%)**	**271**	**65%**
MATH 115	See Counselor	36 (3%)	29	81%	25 (3%)	20	80%	61 (3%)	49	80%
	Support Strongly Recommended	125 (10%)	50	40%	98 (11%)	47	48%	223 (10%)	97	43%
	Support Recommended	246 (19%)	114	46%	167 (19%)	75	45%	413 (19%)	189	46%
	No Support Recommended	667 (51%)	440	66%	441 (50%)	281	64%	1108 (50%)	721	65%
	No Score Available	232 (18%)	153	66%	158 (18%)	101	64%	390 (18%)	254	65%
	Total	**1306 (100%)**	**786**	**60%**	**889 (100%)**	**524**	**59%**	**2195 (100%)**	**1310**	**60%**
MATH 128	See Counselor	- (4%)	-	75%	- (1%)		0%	- (3%)	-	60%
	Support Strongly Recommended	5 (5%)	-	40%	5 (7%)	-	40%	10 (6%)	-	40%
	Support Recommended	16 (16%)	13	81%	6 (8%)		0%	22 (13%)	13	59%
	No Support Recommended	39 (39%)	34	87%	42 (58%)	25	60%	81 (47%)	59	73%
	No Score Available	35 (35%)	32	91%	19 (26%)	7	37%	54 (31%)	39	72%
	Total	**99 (100%)**	**84**	**85%**	**73 (100%)**	**34**	**47%**	**172 (100%)**	**118**	**69%**
Grand Total		**1619**	**1008**	**62%**	**1165**	**691**	**59%**	**2784**	**1699**	**61%**

Table 3: Success Rates of Students taking STEM Math Courses in Fall 2020 and Spring 2021 by MMS Score

Course	MMS Recommendation	Fall 2020			Spring 2021			Fall 2020 + Spring 2021		
		Total Attempted (% Enrolled)	Successfully Passed Course	% Passed	Total Attempted (% Enrolled)	Successfully Passed Course	% Passed	Total Attempted (% Enrolled)	Successfully Passed Course	% Passed
MATH 135	See Counselor	29 (7%)	26	90%	- (2%)	-	50%	33 (5%)	28	85%
	Support Strongly Recommended	28 (7%)	6	21%	38 (15%)	16	42%	66 (10%)	22	33%
	Support Recommended	57 (13%)	30	53%	45 (17%)	15	33%	102 (15%)	45	44%
	No Support Recommended	194 (45%)	134	69%	108 (42%)	63	58%	302 (44%)	197	65%
	No Score Available	121 (28%)	86	71%	63 (24%)	39	62%	184 (27%)	125	68%
	Total	**429 (100%)**	**282**	**66%**	**258 (100%)**	**135**	**52%**	**687 (100%)**	**417**	**61%**
MATH 140	See Counselor				27 (10%)	26	96%	27 (5%)	26	96%
	Support Strongly Recommended	- (2%)	-	50%	5 (2%)	-	60%	9 (2%)	5	56%
	Support Recommended	25 (11%)	11	44%	23 (8%)	10	43%	48 (10%)	21	44%
	No Support Recommended	137 (62%)	86	63%	142 (50%)	117	82%	279 (55%)	203	73%
	No Score Available	55 (25%)	34	62%	85 (30%)	73	86%	140 (28%)	107	76%
	Total	**221 (100%)**	**133**	**60%**	**282 (100%)**	**229**	**81%**	**503 (100%)**	**362**	**72%**
Grand Total		**650**	**415**	**64%**	**540**	**364**	**67%**	**1190**	**779**	**65%**

2020-2021 Program Review Report

Division/Area Name: Physical Sciences	For Planning Years: 2022-2023
Name of person leading this review: Paul Stahmann	
Names of all participants in this review: Kenneth Underwood, Alex Schroer	

Part 1. Program Overview:

1.1.Briefly describe how the program contributes to the district mission

The Physical Science courses provide the students of AVC with a 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 intent 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.

1.2.State briefly program highlights and accomplishments

Student retention rates have increased by 5% and success rates have increased by an average of 9% over the last 2 years. Textbook materials were redundant difficult for student engagement and were replaced by the AVC faculty writing their own labs and lecture materials.

***1.3. Check each** Institutional Learning Outcome (ILO) **supported by the program.** Type an "X" if checkbox is unavailable.*

X Communication	X Demonstrates analytical reading and writing skills including research, quantitative and qualitative evaluation and synthesis. ☐ Demonstrates listening and speaking skills that result in focused and coherent communications
X Creative, Critical, and Analytical Thinking	X Uses intellectual curiosity, judgment and analytical decision-making in the acquisition, integration and application of knowledge and skills. X Solves problems utilizing technology, quantitative and qualitative information and mathematical concepts.
☐ Community/Global Consciousness	☐ Understands and applies personal concepts of integrity, ethics, self-esteem, lifelong learning, while contributing to the well-being of society and the environment. ☐ Demonstrates an awareness and respect of the values of diversity, complexity, aesthetics and varied cultural expressions.
☐ Career and Specialized Knowledge	X Demonstrates knowledge, skills and abilities related to student educational goals, including career, transfer and personal enrichment.

***1.4. Check each** Educational Master Plan (EMP)/Strategic Plan Goal **supported by the program.** Type an "X" if checkbox is unavailable.*

X **Goal 1:** Commitment to strengthening institutional effectiveness measures and practices.

x **Goal 2:** Increase efficient and effective use of resources: Technology; Facilities; Human Resources; Business Services.
x **Goal 3:** Focus on utilizing proven instructional strategies that will foster transferable intellectual skills.
☐ **Goal 4:** Advance more students to college-level coursework-Develop and implement effective placement tools.
☐ **Goal 5:** Align instructional programs to the skills identified by the labor market.

Part 2.A. Please provide the results of any internal and external environmental scan information you have gathered related to the program e.g. surveys, interviews, focus groups, advisory groups, licensure exam scores, job placement, State mandates, etc.:

The satisfaction of students surveyed in our classes during the Fall semester of 2019 revealed that the majority felt somewhat or very satisfied with the content of the courses.

Part 2.B. Analyze the program review data (please see the program review data retrieval instructions and attach your program review data page with any other supporting documents), the above environmental scan information, and anything else related to your area to identify the program strengths, weaknesses, opportunities, & threats (SWOT):

Strengths	Retention rates have increased over the four-year period of 2017-18 to 2020-21 from 90.1% to 94.2%. Success rates have increased over the four-year period of 2017-18 to 2020-21 from 81.8% to 88.5%. During this time, the program has remained well above the college average retention and success rates. Sections taught at the Lancaster main campus generally are filled to capacity. The presence of a full-time physical science lab technician has been essential for the continued success of the area.
Weaknesses	The online teaching approach due to Covid-19 has been difficult for the labs but the instructors have been creative in delivering ways to teach the content.
Opportunities	Provide students with the most up-to-date equipment and technology. Improve quality of laboratory exercises.
Threats	We have a fully equipped lab in the Palmdale campus, but enrollment has been consistently low or not available.

Part 2.C. Review and comment on progress towards SLO/PLO/OO Outcomes Analysis (fka Action Plans):

The SLO for the year was met or exceeded with a 92.9% rate. This is an excellent rate for students to have met and achieved the comprehension of many variables introduced in the lower level physical science course. The fact that 3 to 4 different full-time and adjunct faculty teach multiple sections per semester shows that the materials are being delivered and understood on a unified and consistent pattern.

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

Progress has been made in areas such as new equipment and new lab experiences for students. A full time physical science lab tech has been hired for the Palmdale campus and an additional lab tech has been hired in Lancaster to assist adjunct faculty during the night sections.

Part 3. Based on Part 2 above, please list program/area goals for 2021-2022:

Program/Area Goal #	***Goal supports which ILO/PLO/SLO/OO?***	***Description of Goal***	***Steps to be taken to achieve goal?***
#1 Improve quality of laboratory exercises.	ILOs 1-4	Faculty continue to improve lab materials being used to teach physical science.	Extra time spent to improve lab materials. Consultation with other faculty.
#2			
#3			

Part 4. Resource Requests that Support Program Needs (Based on above analyses and listed in priority order):

Type of Resource Request	*Summary of Request*	*New or Repeat Request*	*Amount of Request, $*	*One-Time or Recurring Cost, $*	*Contact's Name*
Faculty					
Classified Staff					
Technology	New laptops in the near future	New	~ $12,000	One-time	Paul Stahmann, Alex Schroer
Technology	AVC hosted trip to National Weather Service Office for class. Evening trip. Not sure of the cost. Must be coordinated with NWS office.	New		Recurring	Ken Underwood
Physical/Facilities	Have room darkening window blinds installed in PSCI room UH239	New	?	One-time	Paul Stahmann
Supplies	On-going budget to upgrade, replace, and acquire new equipment for the labs and demonstrations.	Repeat	Annual budget	Recurring	Paul Stahmann, Alex Schroer
Professional Development	Budget to attend national conferences where research and teaching ideas are shared.	New	$2000	Recurring annually	Paul Stahmann, Alex Schroer
Other					

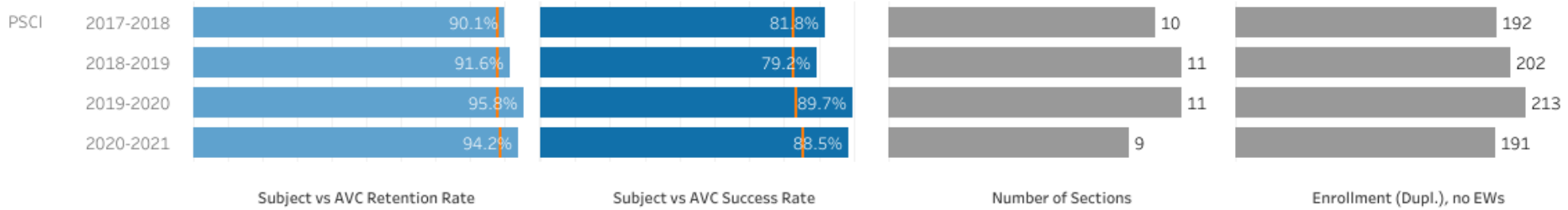
****REQUIRED: After gathering the information above, fill out your RESOURCE REQUESTS to be shared with the Budget Committee: https://www.surveymonkey.com/r/20-21ProgramReview**

Part 5. Insert your Program Review Data here, as well as any other supporting data. (See Part 2.B above.)

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

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

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



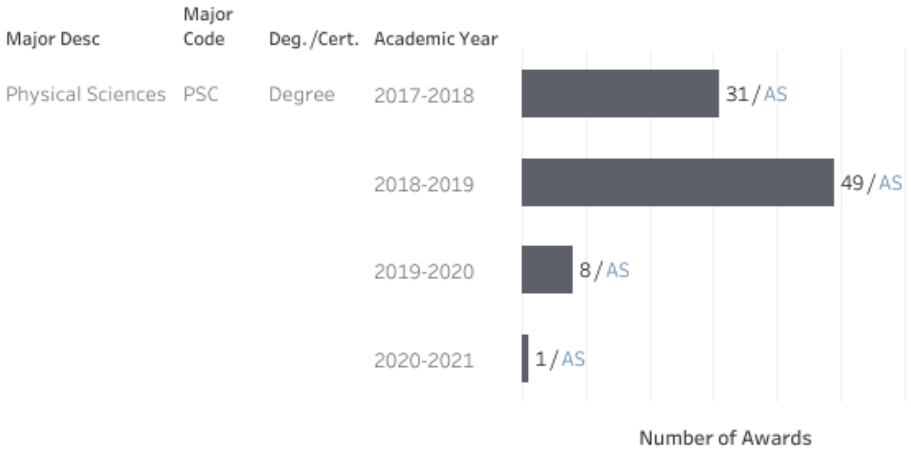
Enrollment and Number of Sections by *Modality* in PSCI

	Instr. Method	2017-2018	2018-2019	2019-2020	2020-2021
Number of Sections	Other Indep Study		1	1	
	Traditional	10	10	10	9
Enrollment	Other Indep Study		4	1	
	Traditional	192	198	216	191

Enrollment and Number of Sections by *Location* in PSCI

	Location	2017-2018	2018-2019	2019-2020	2020-2021
Number of Sections	Lancaster	9	9	9	7
	Palmdale	1	2	2	2
Enrollment	Lancaster	185	176	175	160
	Palmdale	7	26	42	31

Number of Degrees/Certificates Awarded in Physical Science (PHSI) & Physical Sciences (PSC)



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

	Fall 2017	Fall 2018	Fall 2019	Fall 2020
PT (Adjunct) FTEF	0.6	1.0	1.0	1.0
FT (Regular) FTEF	1.2	0.8	0.8	0.8
TOTAL FTEF	1.8	1.8	1.8	1.8
PT/FT FTEF Ratio	0.5	1.3	1.3	1.3
FTES	17.0	18.5	21.0	20.1
FTES/FTEF Ratio	9.5	10.3	11.7	11.2
WSCH/FTEF Ratio	283.8	308.8	350.5	335.0

Click here
to see AVC's Program
awards dashboard

Academic Year	Subject	Break by..
Multiple values	PSCI	None

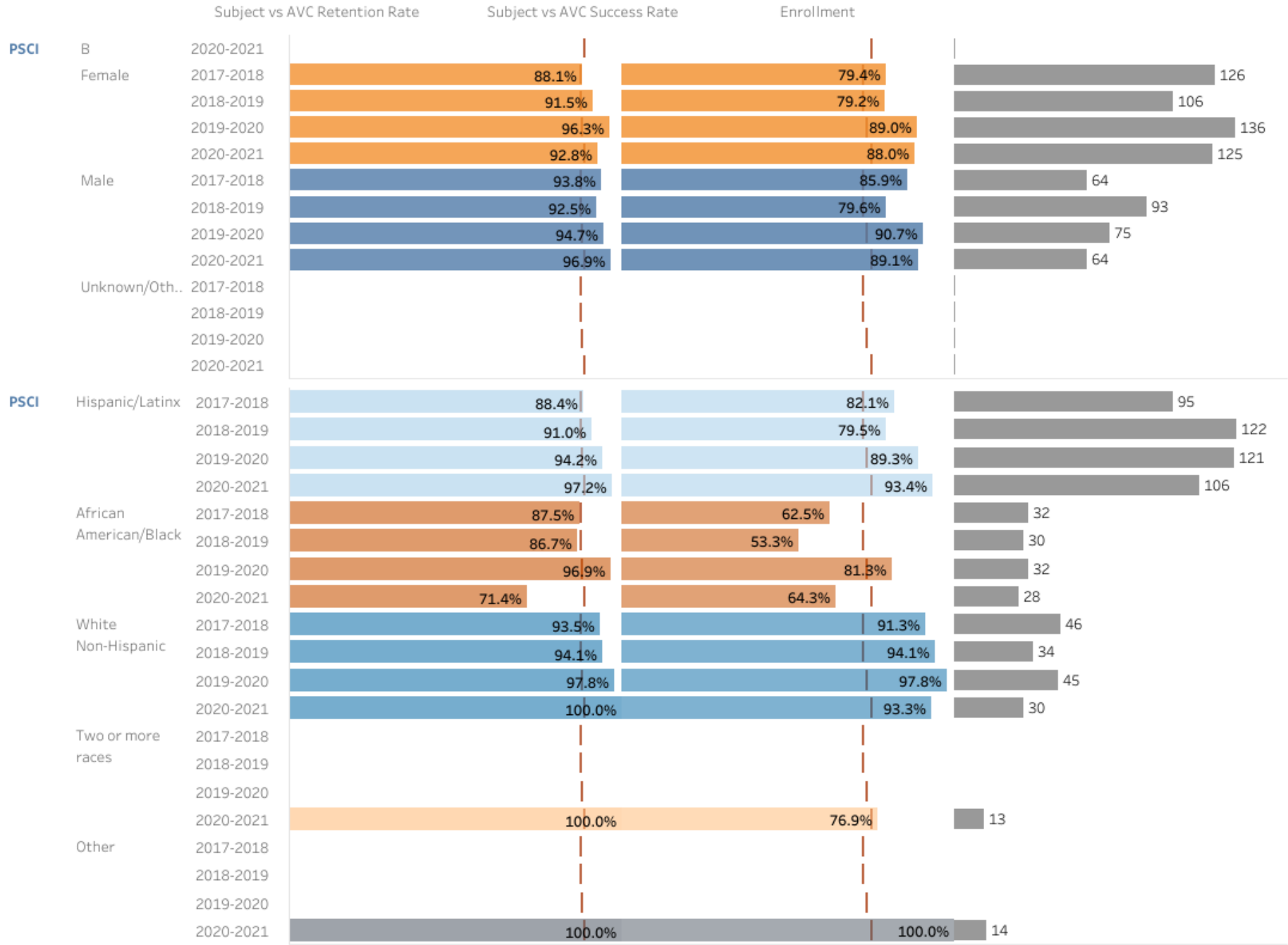
Success (and Enrollment) Numbers in Subject(s) PSCI by Academic Year (Hover over the numbers for Retention)

	2017-2018	2018-2019	2019-2020	2020-2021	Grand Total
PSCI	81.8% (192)	79.2% (202)	89.7% (213)	88.5% (191)	84.8% (798)
Grand Total	81.8% (192)	79.2% (202)	89.7% (213)	88.5% (191)	84.8% (798)

Enrollment, Number of Sections by Course Number

Annual or Term	Term	Select a Course Number
Annual	All	All

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



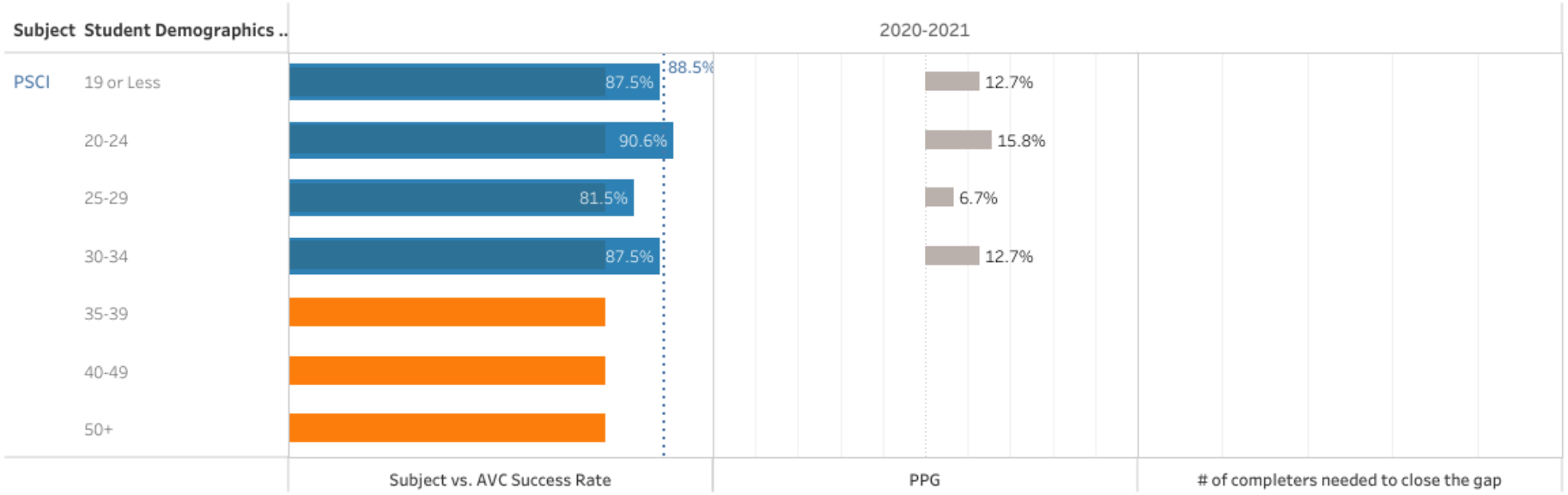
Select Demographics
Age Groups

Academic Year Slider

Click to Include EWs

2020-2021 Disproportionate Impact (DI) as Percentage Point Gap (PPG)

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



In 2020-2021, PSCI's Success Rate was 88.5% vs. AVC's Annual rate of 74.8%

Overall Disproportionate Impact as percentage point gap was : 13.7%

In PSCI, 191 was the enrollment count (duplicated headcount) (only shows if $n > 10$)

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

(For example, (191 * |13.7%|)=26*. it means that 26 more successful course completers would help close the gap for this subject area)*

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

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

- What are the potential reasons for equity gaps?

- What can my program implement to mitigate these gaps?

- What resources are available to support these efforts?

ANTELOPE VALLEY COLLEGE

2020-2021 Program Review Report

Division/Area Name: Math, Sciences, and Engineering / Physics	**For Planning Years: 2022-2023**
Name of person leading this review: Dr. Jason Bowen	
Names of all participants in this review: Dr. Chrysanthos Kyriakides, Dr. Mark McGovern, Dr. Jason Bowen	

Part 1. Program Overview:

1.1.Briefly describe how the program contributes to the district mission

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

1.2.State briefly program highlights and accomplishments

Despite a challenging academic year due to the COVID-19 pandemic and purely online instruction, enrollments and section offerings remained largely flat year-over-year. Total enrollment and sections offered in the physics program at Antelope Valley was 589 (duplicated) students and 25 sections. In the academic year prior to the current cycle total enrollment was 594 (duplicated) students and 26 sections. Total FTEF remained unchanged at 4.3 year-over-year and FTES saw an increase from 53.0 to 55.1 year-over-year, and the overall 80.6% student success rate is larger than the campus wide 74.8% average. A full-time tenure track contract faculty member was also hired during the 2020-2021 academic year.

***1.3. Check each** Institutional Learning Outcome (ILO) **supported by the program.** Type an "X" if checkbox is unavailable.*

☐ **Communication**	x Demonstrates analytical reading and writing skills including research, quantitative and qualitative evaluation and synthesis. ☐ Demonstrates listening and speaking skills that result in focused and coherent communications
☐ **Creative, Critical, and Analytical Thinking**	x Uses intellectual curiosity, judgment and analytical decision-making in the acquisition, integration and application of knowledge and skills. x Solves problems utilizing technology, quantitative and qualitative information and mathematical concepts.

☐ **Community/Global Consciousness**	x Understands and applies personal concepts of integrity, ethics, self-esteem, lifelong learning, while contributing to the well-being of society and the environment. ☐ Demonstrates an awareness and respect of the values of diversity, complexity, aesthetics and varied cultural expressions.
☐ **Career and Specialized Knowledge**	x Demonstrates knowledge, skills and abilities related to student educational goals, including career, transfer and personal enrichment.

***1.4. Check each** Educational Master Plan (EMP)/Strategic Plan Goal **supported by the program.** Type an "X" if checkbox is unavailable.*

☐ **Goal 1:** Commitment to strengthening institutional effectiveness measures and practices.

x **Goal 2:** Increase efficient and effective use of resources: Technology; Facilities; Human Resources; Business Services.

x **Goal 3:** Focus on utilizing proven instructional strategies that will foster transferable intellectual skills.

x **Goal 4:** Advance more students to college-level coursework-Develop and implement effective placement tools.

x **Goal 5:** Align instructional programs to the skills identified by the labor market.

Part 2.A. Please provide the results of any internal and external environmental scan information you have gathered related to the program e.g. surveys, interviews, focus groups, advisory groups, licensure exam scores, job placement, State mandates, etc.:

None.

Part 2.B. Analyze the program review data (please see the program review data retrieval instructions and attach your program review data page with any other supporting documents), the above environmental scan information, and anything else related to your area to identify the program strengths, weaknesses, opportunities, & threats (SWOT):

Strengths	Demand for physics courses remains strong. Enrollments have remained steady year-over-year while FTES increased from 53.0 to 55.1. The overall student success rate is larger than the campus wide average.
Weaknesses	The SARS-CoV-2 pandemic was identified as a potential threat in the prior program review cycle. Specifically, it was stated: "SARS-CoV-2 pandemic may depress enrollments and reverse gains. May also have an adverse effect on retention and success rates especially with regards to more financially and socially vulnerable student populations." That statement proved prescient. A reversal of prior gains has indeed occurred in the current cycle where retention rates have dropped from 94.8% in the 2019-2020 academic year to 86.5% in the 2020-2021 academic year (the current cycle), lower than the campus wide 88.6% retention rate. The overall success rate also dropped year over to from 87.5% in the prior cycle to 80.6% in the current cycle. Moreover, when retention and success rates are analyzed by race/ethnicity, the sharpest drops are observed in the African American/Black student population. In the 2019-2020 academic year the retention rate for African American/Black students was 91.3%, higher than the 87.9% campus wide average. In the 2020-2021 academic year the retention rate fell to 71.9%, the lowest observed figure among all the demographics in the current cycle. In addition, the success rate for African American/Black students is

59.4%, the only success rate among all demographics smaller than the campus wide averages. In the prior cycle the success rate for African American/Black students was 82.6%, a number larger than the 73.2% campus average in the 2019-2020 academic year for that demographic. A weakness is observed in identifying at-risk students and intervening to improve retention and success rates, especially among the most vulnerable demographics, where otherwise demand for physics courses remains strong and overall enrollments have not experienced declines.

Opportunities Demand for physics courses remains strong however retention rates have dropped sharply year-over-year. An opportunity exists to identify at-risk students for interventions to improve retention rates.

Threats Ongoing challenges due to the COVID-19 pandemic and socio-economic factors may continue to depress retention and success rates or stall recovery to pre-pandemic levels. Improvements in retention and success rates in more vulnerable demographics may lag any gains observed in less at-risk demographics.

Part 2.C. Review and comment on progress towards SLO/PLO/OO Outcomes Analysis (fka Action Plans):

Past outcomes analysis identified student deficiencies in using appropriate terminology, mathematical language, and problem-solving strategies to effectively communicate the various concepts governing our understanding of kinematics, Newton's laws, statics, linear momentum, linear-rotational analogs, and rotational dynamics. To this end a focus on laboratory activities was adjusted in the last couple of years in response to SLO data showing that students were not comprehending the principles and processes involved in collecting data and analyzing it. Emphasis has also been placed on data analysis. Adjustments to lab activities to help students with the process of collecting data, understanding error analysis, and how to visually represent the data when it is deemed important were made. These measures have proved successful according to SLO data. In analyzing the possible reason(s) for this improvement it must be stated that for the entirety of the 2020-2021 academic year at Antelope Valley College all laboratory meetings occurred synchronously online due to the SARS-CoV-2 pandemic. It is therefore difficult to ascertain why these successes were observed given that traditional methods of instructional delivery were replaced with purely online methods which likely varied from instructor to instructor as each instructor independently navigated and availed themselves of the technological methods/options available for online instruction. One plausible reason for the observed improvement may be provided, however: ineffective strategies and instructional methods were identified in Fall 2020 and eliminated in Spring 2021 and/or significantly improved, whereas measures implemented in March 2020 were of a stopgap and experimental nature due to the sudden shift from face-to-face learning to a purely online learning environment. This would have had a greater impact on laboratory activities which severely impact performance measured by the relevant assessments. In Fall 2020 deeper considerations of instructional methods and greater preparedness were present which permitted a more thorough assessment of the effectiveness of the strategies employed in the virtual classrooms. This would impact laboratory activities more severely as complete virtual replacements were necessitated, where the pertinent assessments were designed so that the skills it accesses are largely obtained during laboratory activities. Other reasons for the observed marked improvement from Fall to Spring include: wider availability of the required technology for online meetings including computers, notebooks, tablets, hotspots, and internet access, economic stability, improved availability of child care for students, and also an improved awareness of the expectations and requirements online learning demands during a full semester. We will continue to standardize virtual laboratory activities as needed and coordinate across sections for online courses and monitor trends in face-to-face meetings during the next cycle for evidence of improved methods and make adjustments in instruction.

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

Student oriented goals established in past program review cycle include increasing student retention rates, increasing student success rates, and realizing 10% annual year-over-year increases in the number of AS-T degrees awarded. In the prior cycle strengths noted were the observed "[i]mproved overall retention and success rates (94.8% and 87.5%, respectively, for the current Program Review cycle). Improved parity in female and male success rates (+13.5% and +15.2% PPG, respectively). 24% increase in awarded AS-T Physics degrees in the 2019-2020 academic year over the prior year; 194% increase in the current period over the 2016-2017 academic year. 10% increase in enrollment in the 2019-2020 academic year and 18% increase in the number of sections offered over the 2016- 2017 academic year." In the current cycle retention rates have dropped from 94.8% in the 2019-2020 academic year to 86.5% in the 2020-2021 academic year (the current cycle), lower than the campus wide 88.6% retention rate. The overall success rate also dropped year over to from 87.5% in the prior cycle to 80.6% in the current cycle. Moreover, when retention and success rates are analyzed by race/ethnicity, the sharpest drops are observed in the African American/Black student population. In the 2019-2020 academic year the retention rate for African American/Black students was 91.3%, higher than the 87.9% campus wide average. In the 2020-2021 academic year the retention rate fell to 71.9%, the lowest observed figure among all the demographics in the current cycle. In addition, the success rate for African American/Black students is 59.4%, the only success rate among all demographics smaller than the campus wide averages. In the prior cycle the success rate for African American/Black students was 82.6%, a number larger than the 73.2% campus average in the 2019-2020 academic year for that demographic. The number of AS-T physics degrees also saw a steep decline from 47 degrees awarded in the 2019-2020 academic year to 28 degrees awarded in the 2020-2021 academic year, a 40% decrease year-over-year. We believe these reversals are due to the COVID-19 pandemic and associated socio-economic and institutional/structural upheaval with more at-risk/vulnerable demographics suffering disproportionately due to endemic societal inequities.

Part 3. Based on Part 2 above, please list program/area goals for 2021-2022:

Program/Area Goal #	***Goal supports which ILO/PLO/SLO/OO?***	***Description of Goal***	***Steps to be taken to achieve goal?***
#1	3	Increase student retention rates to pre-pandemic levels	Increase communication channels to promote in-person interventions by: (1) state clearly the first day of class the anticipated challenges some students will face due to societal obstacles exacerbated by the COVID-19 pandemic, (2) encourage students that the challenges can be overcome, (3) direct students to the relevant webpages hosted by the college detailing the

			programs/resources/hotlines on offer to combat obstacles students face including food insecurity, homelessness, etc. (4) encourage students to visit the instructor during office hours if students are thinking of dropping the course.
#2	3	Increase student success rates to pre-pandemic levels	(1) Identify poor performing students using test scores, homework scores, and laboratory scores, (2) Contact students and arrange a meeting, (3) Identify the specific challenges preventing satisfactory academic performance, (4) Determine a plan including increasing the number solved problems presented in class, meeting with a tutor in the learning center, seeing the instructor regularly during office hours to review the material, etc.
#3	3,4	Increase the number of AS-T degrees to pre-pandemic levels	Increase retention and success rates.

Part 4. Resource Requests that Support Program Needs (Based on above analyses and listed in priority order):

Type of Resource Request	*Summary of Request*	*New or Repeat Request*	*Amount of Request, $*	*One-Time or Recurring Cost, $*	*Contact's Name*
Faculty	Additional adjunct faculty	Repeat	See HR	Recurring	Dr. Jason Bowen
Classified Staff	None	None	None	None	None
Technology	MSO 5104 oscilloscopes (6); RTSA 3045 spectrum analyzers (6), MSO	New	56720.00	One-Time	Dr. Jason Bowen

	8064 oscilloscope (1), differential probe 160 (6), current probe (6)				
Physical/Facilities	None	None	None	None	None
Supplies	1 gallon (4L) of ethanol 95% (2x), e/m apparatus (coils) (3x), e/m apparatus (tubes) (3x), pulley cord (12x), dual range force sensors (6x), digital thermometers (6x), electronic balances (6x)	Repeat	10000.00	One-Time	Dr. Chrysanthos Kyriakides
Professional Development	Conferences including registration and travel	Repeat	10000.00	Recurring	Dr. Jason Bowen
Other	Video and imaging editing software licenses; video capture equipment; additional Mathematica software licenses	Repeat	10000.00	One-Time	Dr. Mark McGovern

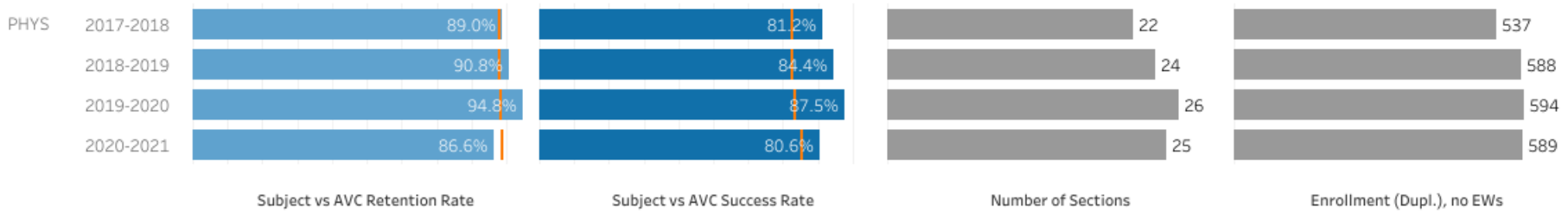
****REQUIRED: After gathering the information above, fill out your RESOURCE REQUESTS to be shared with the Budget Committee: https://www.surveymonkey.com/r/20-21ProgramReview**

Part 5. Insert your Program Review Data here, as well as any other supporting data. (See Part 2.B above.)

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

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

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



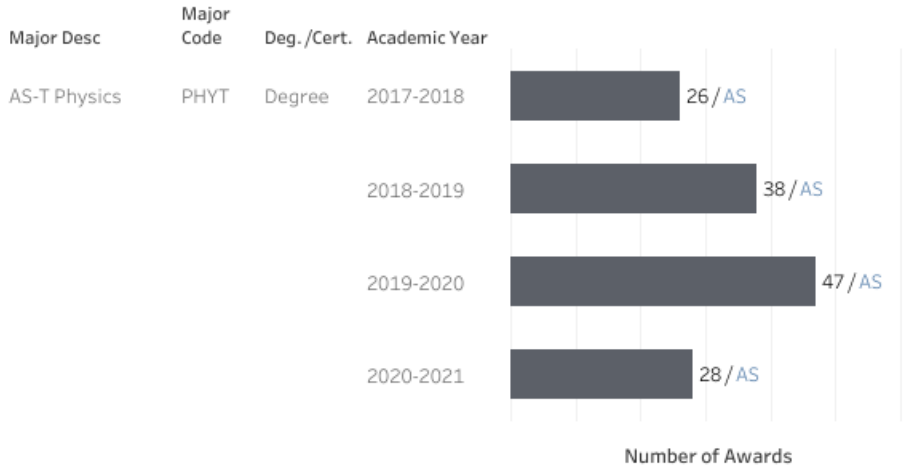
Enrollment and Number of Sections by ***Modality*** in PHYS

	Instr. Method	2017-2018	2018-2019	2019-2020	2020-2021
Number of Sections	Traditional	22	24	26	25
Enrollment	Traditional	537	588	607	589

Enrollment and Number of Sections by ***Location*** in PHYS

	Location	2017-2018	2018-2019	2019-2020	2020-2021
Number of Sections	Lancaster	22	24	26	25
Enrollment	Lancaster	537	588	607	589

Number of Degrees/Certificates Awarded in AS-T Physics (PHYT)

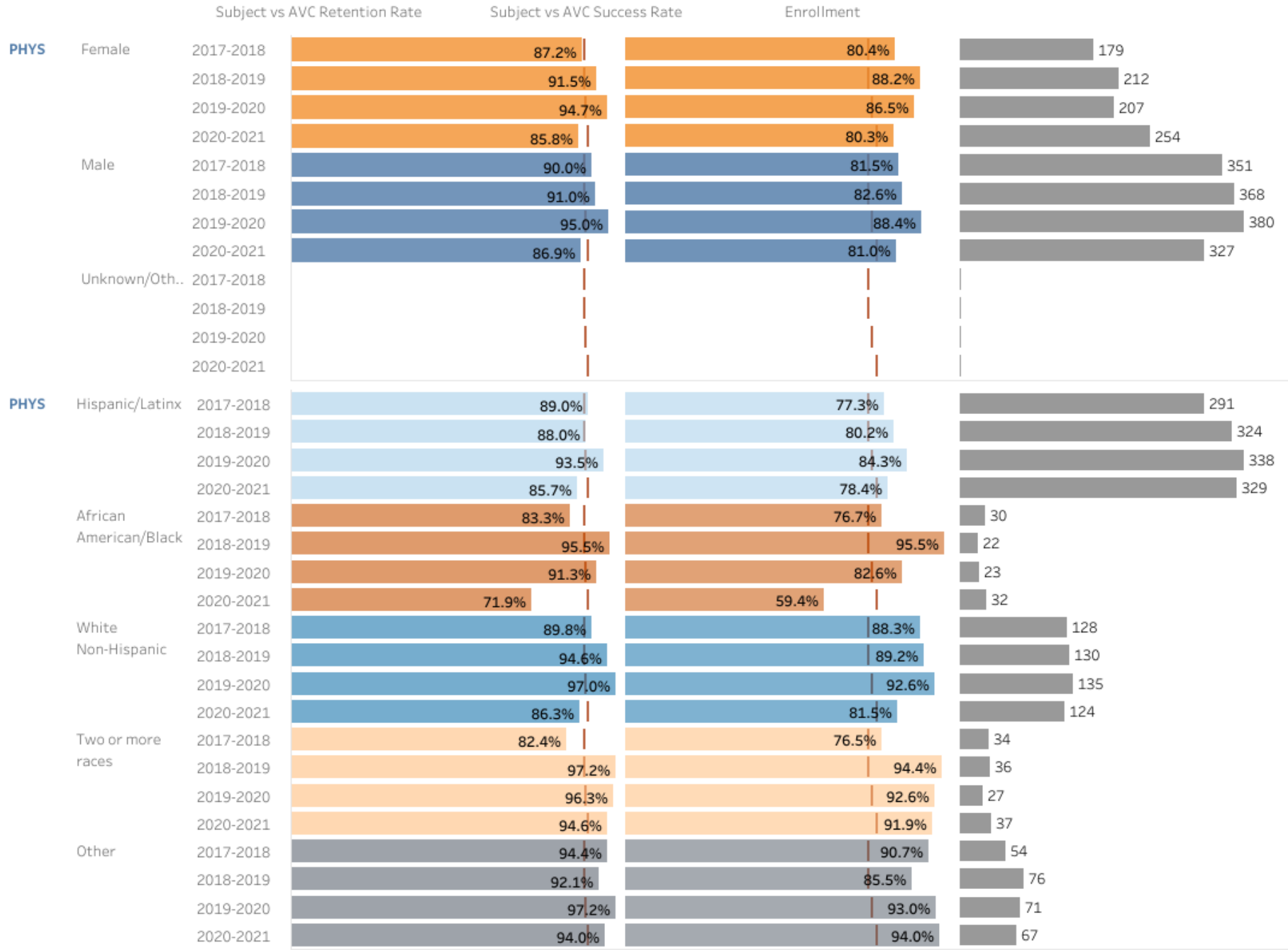


FTEF by Contract Type, Part-time/Full-time Ratio, FTES, FTES/FTEF in PHYS

	Fall 2017	Fall 2018	Fall 2019	Fall 2020
PT (Adjunct) FTEF			0.4	0.6
FT (Regular) FTEF	2.5	2.5	2.7	2.7
FT (Overload) FTEF	1.0	1.0	1.2	1.0
TOTAL FTEF	3.5	3.5	4.3	4.3
PT/FT FTEF Ratio	0.0	0.0	0.1	0.2
FTES	44.4	49.8	53.0	55.1
FTES/FTEF Ratio	12.8	14.4	12.2	12.8
WSCH/FTEF Ratio	383.8	430.6	367.2	384.1

Click here to see AVC's Program awards dashboard

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



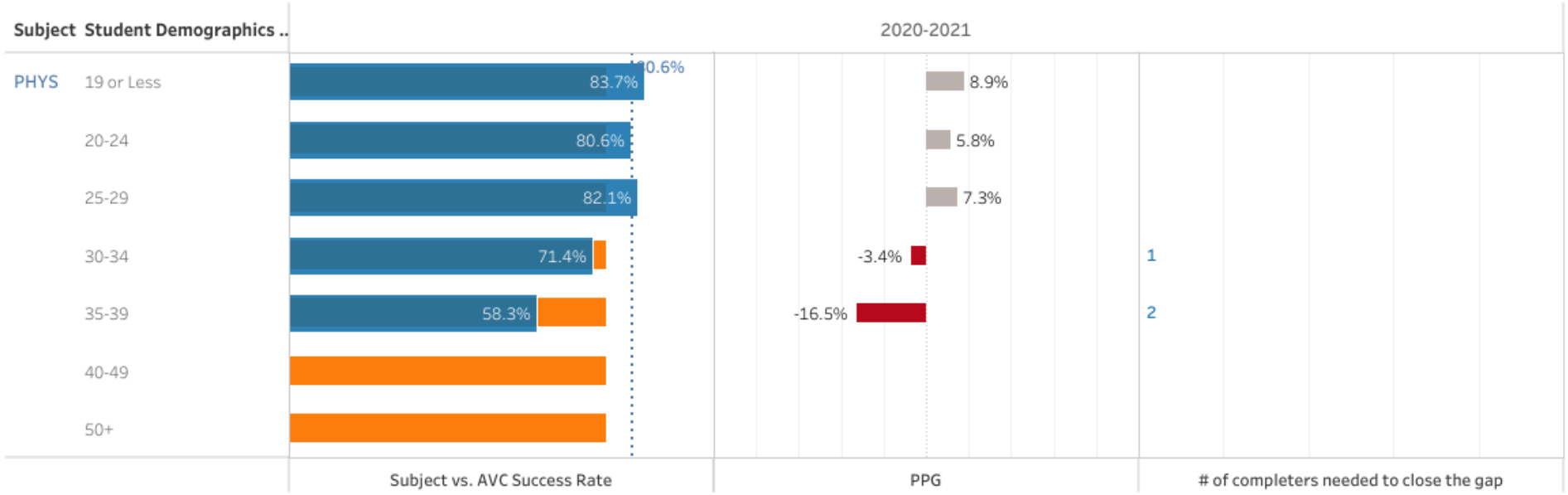
Select Demographics
Age Groups

Academic Year Slider

Click to Include EWs

2020-2021 Disproportionate Impact (DI) as Percentage Point Gap (PPG)

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



In 2020-2021, PHYS's Success Rate was 80.6% vs. AVC's Annual rate of 74.8%

Overall Disproportionate Impact as percentage point gap was : 5.8%

In PHYS, 589 was the enrollment count (duplicated headcount) (only shows if $n > 10$)

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

(For example, (589 * |5.8%|)=34*. it means that 34 more successful course completers would help close the gap for this subject area)*

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

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

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

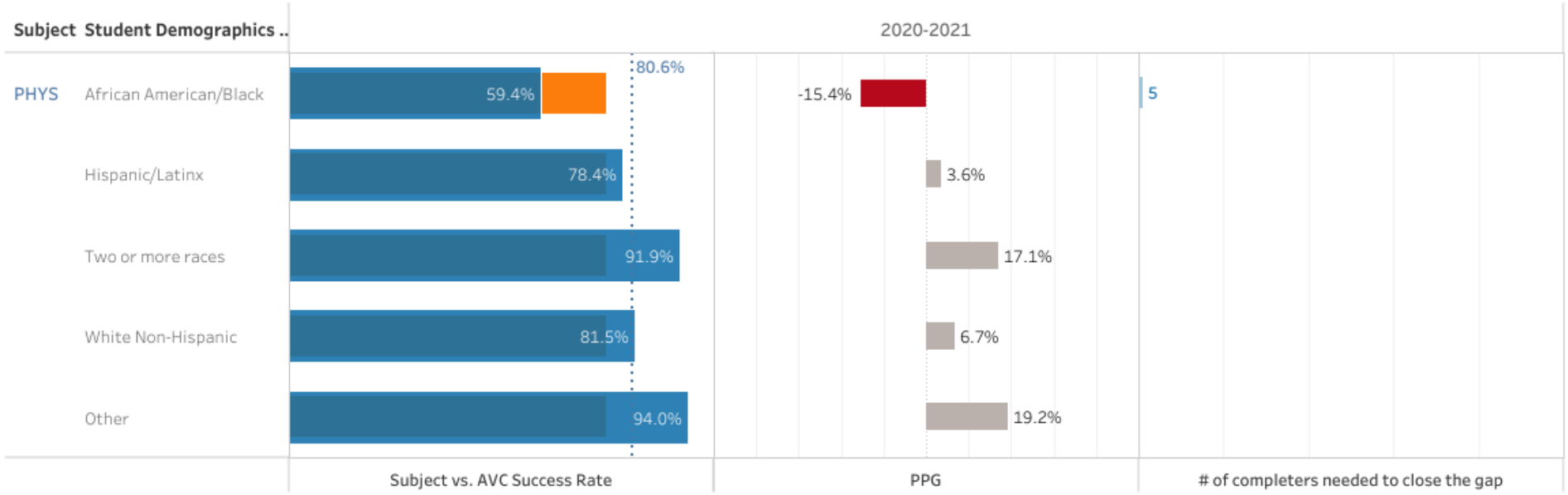
Select Demographics
Race/Ethnicity

Academic Year Slider

Click to Include EWs

2020-2021 Disproportionate Impact (DI) as Percentage Point Gap (PPG)

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



In 2020-2021, PHYS's Success Rate was 80.6% vs. AVC's Annual rate of 74.8%

Overall Disproportionate Impact as percentage point gap was : 5.8%

In PHYS, 589 was the enrollment count (duplicated headcount) (only shows if $n > 10$)

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

(For example, (589 * |5.8%|)=34. *it means that 34 more successful course completers would help close the gap for this subject area)*

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

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

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

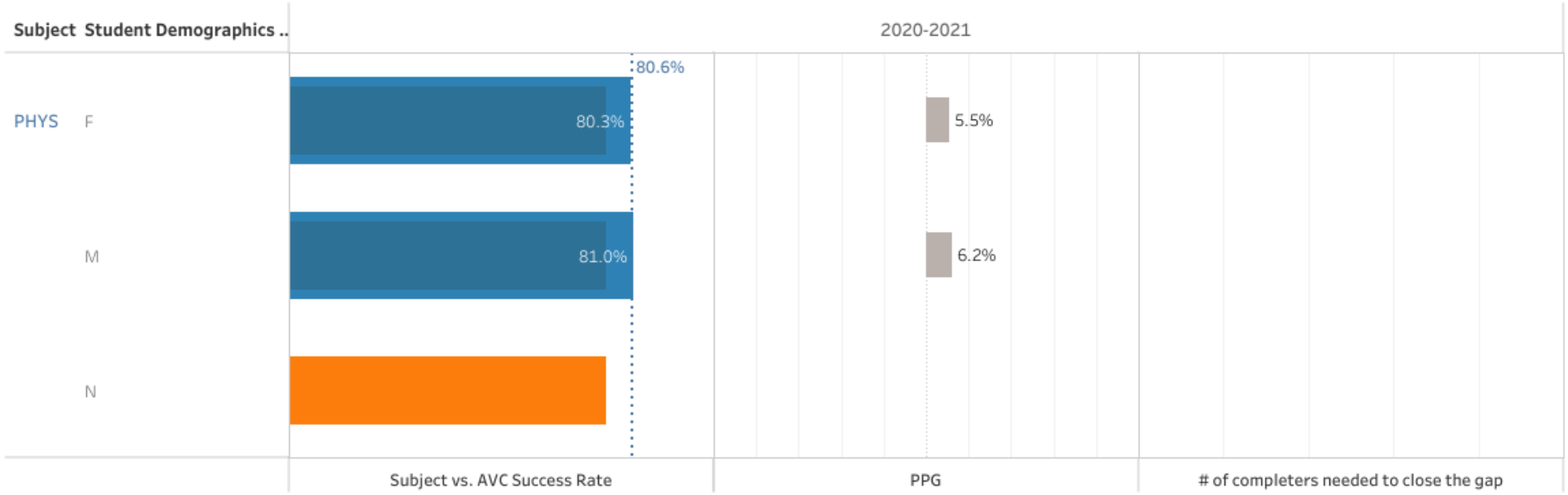
Select Demographics
Gender

Academic Year Slider

Click to Include EWs

2020-2021 Disproportionate Impact (DI) as Percentage Point Gap (PPG)

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



In 2020-2021, PHYS's Success Rate was 80.6% vs. AVC's Annual rate of 74.8%

Overall Disproportionate Impact as percentage point gap was : 5.8%

In PHYS, 589 was the enrollment count (duplicated headcount) (only shows if $n > 10$)

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

(For example, (589 * |5.8%|)=34*. it means that 34 more successful course completers would help close the gap for this subject area)*

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

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

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

2020-2021 Program Review Report

Division/Area Name: MSE Division – Water Treatment	For Planning Years: 2022-2023
Name of person leading this review: Toby Taube	
Names of all participants in this review: Christos Valiotis, Dean	

Part 1. Program Overview:

Note to the reviewers: The Water Treatment program is a unique and focused program that was developed by and at the request of the local water agency with the single goal of preparing students for the state licensing test. The curriculum was developed and is taught by two local water specialists wo are employed by the water agency ad ae qualified to be adjuncts at AVC. During the last 3 semesters the program has been on hiatus because the state suspended the state licensing exams. As a result, no student data are presented here.

1.1.Briefly describe how the program contributes to the district mission
The Water Treatment courses prepare students for various grade level water treatment and / or distributions examinations administered by the California State Water Resources Control Board. Specific courses may be used as secondary course required for specialized training for students who wish to enter the or who are already employed in the water treatment and distribution fields, as defined by the California State Water Resources Control Board. This is in line with the districts mission of offering workforce programs, job preparation courses (non-degree applicable) and a variety of services that contribute to the educational and economic well -being of the community.
1.2.State briefly program highlights and accomplishments
From the fall of 2016 to spring of 2020, 52 students successfully completed classes and 30 of those currently hold certifications.

1.3. Check each Institutional Learning Outcome (ILO) supported by the program. *Type an "X" if checkbox is unavailable.*	
☐ **Communication**	☐ Demonstrates analytical reading and writing skills including research, quantitative and qualitative evaluation and synthesis. ☐ Demonstrates listening and speaking skills that result in focused and coherent communications
√ **Creative, Critical, and Analytical Thinking**	☐ Uses intellectual curiosity, judgment and analytical decision-making in the acquisition, integration and application of knowledge and skills. √ Solves problems utilizing technology, quantitative and qualitative information and mathematical concepts.
☐ **Community/Global Consciousness**	☐ Understands and applies personal concepts of integrity, ethics, self-esteem, lifelong learning, while contributing to the well-

	being of society and the environment. ☐ Demonstrates an awareness and respect of the values of diversity, complexity, aesthetics and varied cultural expressions.
√ **Career and Specialized Knowledge**	√ Demonstrates knowledge, skills and abilities related to student educational goals, including career, transfer and personal enrichment.

1.4. Check each Educational Master Plan (EMP)/Strategic Plan Goal supported by the program. *Type an "X" if checkbox is unavailable.*

☐ **Goal 1:** Commitment to strengthening institutional effectiveness measures and practices.

√ **Goal 2:** Increase efficient and effective use of resources: Technology; Facilities; Human Resources; Business Services.

☐ **Goal 3:** Focus on utilizing proven instructional strategies that will foster transferable intellectual skills.

☐ **Goal 4:** Advance more students to college-level coursework-Develop and implement effective placement tools.

√ **Goal 5:** Align instructional programs to the skills identified by the labor market.

Part 2.A. Please provide the results of any internal and external environmental scan information you have gathered related to the program e.g. surveys, interviews, focus groups, advisory groups, licensure exam scores, job placement, State mandates, etc.:

The State traditionally gave the certification tests twice a year, in person, pencil paper testing, six months apart. Due to Covid the State had cancelled all its in person testing for 2020. In 2021 the State resumed testing in a computer-based testing format. The State has contracted with Prometric testing service. This was done to increase the number of testing locations and tests can be taken year-round. Unfortunately, since there was no testing in 2020 the State has a back log of applicants that it is trying to process through the system. As a result, no students from the fall of 2019, spring 2020 or fall of 2020 have been certified. Other possibilities are that the students have lost interest in the field due to the delay or gained employment in another career due to the pandemic.

Part 2.B. Analyze the program review data (please see the program review data retrieval instructions and attach your program review data page with any other supporting documents), the above environmental scan information, and anything else related to your area to identify the program strengths, weaknesses, opportunities, & threats (SWOT): The program offers five course sections taught by two adjunct instructors in who are employees of local water agencies. The fall of 2020 had 21 registered students for two classes and a retention rate of 66.7% below the 84% four year average retention rate. Due to Covid and the switch to online only, registration numbers significantly dropped, and classes were cancelled. Success rate for 2020 – 2021 was 47.6 %, well below the four year average of 57%

Strengths	By taking only three classes the students can prepare for various grade level water treatment and or distribution examinations administered by the California Water Resources Control Board. Certifications are required by the safe drinking water act for every anyone that operates distribution and or treatment systems that may affect water quality. Generally, this applies to all field employees other than entry level positions.

Weaknesses	The program is not well advertised, mainly passing by word of mouth at the local water agencies, and it can benefit from a FT faculty supervision. Advertising directly to local water agencies via an email list may be a way to make direct contacts and target an already known audience.
Opportunities	Hiring a FT chemistry instructor to teach and supervise the program. As our population in Southern California increases the demand for water service also continues to increase. At the same time our population ages, the rate of retirements has increased. This in turn has dramatically increased the demand for labor in the water utility fields.
Threats	Any program taught with only adjuncts cannot really grow, at the same time, enrollment might not justify a full time position.

Part 2.C. Review and comment on progress towards SLO/PLO/OO Outcomes Analysis (fka Action Plans):

Spring of 2020 was switched to online only in mid-March, and all of fall 2020 was online. The change in format was a difficult transition for instructors and none of the traditional help for students, mostly in person, was available.

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

Again, due to Covid all in person meetings in 2020 were cancelled. All the previous program steps involved meeting in public to support program goals.

Part 3. Based on Part 2 above, please list program/area goals for 2021-2022:

Program/Area Goal #	***Goal supports which ILO/PLO/SLO/OO?***	***Description of Goal***	***Steps to be taken to achieve goal?***
Capture community interest	ILO: 4,7	Educate public / schools	Participate in community expos
Capture water agency	ILO:4,7	Coordinate training with water agencies	Conduct meeting and present course information
Outreach	ILO:4,7	Raise awareness for the benefits of water related jobs/education	Promotional brochures, attend community functions, coordinate with local LES's.

Part 4. Resource Requests that Support Program Needs (Based on above analyses and listed in priority order):

Type of Resource Request	***Summary of Request***	***New or Repeat Request***	***Amount of Request, $***	***One-Time or Recurring Cost, $***	***Contact's Name***
Faculty	Full time faculty, to supervise coordinate and attend program and	Repeat	$100,000	recurring	C. Valiotis

	public functions, promoting program goals.				
Classified Staff					
Technology					
Physical/Facilities					
Supplies					
Professional Development					
Other					

****REQUIRED: After gathering the information above, fill out your RESOURCE REQUESTS to be shared with the Budget Committee: https://www.surveymonkey.com/r/20-21ProgramReview**

Part 5. Insert your Program Review Data here, as well as any other supporting data. (See Part 2.B above.)