



Full Review

PALO VERDE COLLEGE

Mathematics and Science Division Program Review
Reporting Fall 2017 to Spring 2021

Associate of Arts with Emphasis in Mathematics and Science

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Table of Contents

1. PURPOSE OF THE PROGRAM	2
2. POPULATION(S) SERVED	3
3. ACCOMPLISHMENTS IN ACHIEVING GOALS	3
4. STRENGTHS, WEAKNESSES & NEW GOALS	4
5. CURRICULUM HISTORY	6
6. COURSE SCHEDULING & AVAILABILITY	8
7. STUDENT LEARNING OUTCOMES (SLO)	9
8. COURSE CURRENCY	13
9. PROFESSIONAL DEVELOPMENT	16
10. STUDENT SUCCESSFUL COMPLETION & RETENTION	17
11. ENROLLMENT TRENDS	26
12. FINANCIAL TRENDS	30
13. FACILITIES AND EQUIPMENT	32

1. PURPOSE OF THE PROGRAM

“Palo Verde College provides opportunities for personal and professional growth to a unique community of learners in an academic environment committed to student success, diversity, equity, and inclusion by supporting student achievement of basic skills, certificate, degree, university transfer, and career goals.” PVC Mission Statement 11/2021

- a. Describe the purpose of the program and its mission.
 - i. Students can obtain an Associate of Arts (AA) with an emphasis in Mathematics and Science. The degree can also prepare the students for transfer to professional schools and universities.
 - ii. The courses in the Mathematics and Science program that have course Identification Numbering System (CIDs) can be transferred to California State University system, University of California system, other higher educational institutions associated with IGETC, and any other community college in California and outside of California.
 - iii. Upon completion of the Mathematics and Science program, students may enter Science, Technology, Engineering and Mathematics (STEM), and Health Science programs in universities and professional schools.
 - iv. In the Mathematics and Science program, students gain quantitative reasoning and critical thinking skills applicable in everyday life
- b. How does the program support the College Mission?
 - i. The transferability of our courses supports the College Mission.
 - ii. Pre-college level basic skills mathematics courses are accessible to students.
 - iii. The Associate of Arts in Mathematics and Science leads to employment opportunities.
 - iv. The courses in the Mathematics and Science program enhance personal and professional growth.
 - v. This program feeds into the health science, allied health, natural and physical science programs.
 - vi. Mathematics and Science programs address and promote critical thinking, scientific methods, and problem-solving abilities.

2. POPULATION(S) SERVED

- a. Describe the populations served by the program, identifying special populations, if any.

The population includes correspondence education students, face-to-face students, online/hybrid students, transfer students, basic skills students, students from diverse backgrounds, transfer students, students who take mathematics/science for professional enrichment, health science/allied health students, natural and physical science students, students obtaining an Associate of Arts in Mathematics and Science. The Math and Science Program offers a variety of courses to students in the communities in Blythe, Needles, and surrounding areas.

- b. Describe other populations that should be served by the program and identify plans for serving them in the future.

The Associate of Arts with Emphasis in Mathematics and Science program serves a diverse population of students. We will offer more face-to-face and correspondence courses. AB 705 (Assembly Bill 705 from California) mandates placement by multiple measures and accelerated MAT 084 and MAT 088 courses being offered. This will benefit a wider variety of students and will enable students to complete the AA degree sooner. Some students are already taking MAT 080 and MAT 082 in a compressed calendar (9 weeks).

3. ACCOMPLISHMENTS IN ACHIEVING GOALS

- a. Describe progress in achieving each goal outlined in the previous Full Review, providing evidence documenting such achievements.

i. ASTRONOMY

Previous Goal: Hire another full-time Astronomy instructor.

2017 Update: A full-time Astronomy instructor was hired.

ii. BIOLOGY

Previous Goals: Obtain another full-time Biology instructor. Hire tutors for Biology.

2017 Update: A full-time Biology instructor was hired. Online tutoring was obtained.

iii. CHEMISTRY

Previous Goals: Online tutoring was obtained. The face-to-face Chemistry lab was reinstated.

2021 Update: Reinstate CHM 109, 210, and 211 courses. Acquire lab instrumentation, equipment, and chemical supplies to facilitate the new chemistry courses to be reinstated. Create an introductory level chemistry course in correspondence modality targeting incarcerated students as well as those from local communities.

iv. MATHEMATICS

Previous Goals: Additional tutoring venues.

2021 Update: Math department is offering tutoring through Student Success Lab and NetTutor, an online tutoring service.

v. GEOLOGY and GEOGRAPHY

Previous Goals: Geoscience courses offered and taught by adjunct faculty.

2021 Update: Full-time Earth Science Instructor hired January 2019.

vi. PHYSICS

Previous Goals: None.

2021 Update: Inactivated PHY 101. Created PHY 100 for all modalities to meet the requirements for degree programs.

- b. Explain modifications, if any, of goals outlined in the previous Full Review, providing evidence documenting such modifications.

No modifications of the goals were reported.

4. STRENGTHS, WEAKNESSES & NEW GOALS

- a. List and comment on the major strengths of the program.

- I. Student enrollment data for the years 2017-2021 Math and Science requirements in other programs contribute to increased enrollments in math and science courses.
- II. Mathematics and Science programs offer classes in face-to-face, online/hybrid, and correspondence modalities, which make our courses more accessible to the students, and thus increase student enrollment in Mathematics and Science program.
- III. Many of the courses within the program have adopted Open Educational Resources (OER) textbooks to make classes more accessible and available to students and encourage equity.
- IV. Adaption of Hawkes Learning System (HLS) helped math program improve its quality by offering online tutoring support, student engagement, and in support of student success.
- V. Since the last program review, the math program improved tutoring services by offering Student Success Lab and NetTutor, an online tutoring service.
- VI. Mathematics and Science division hired four new faculty members to meet the demand in Biology, Chemistry and Astronomy/Mathematics courses.
- VII. A geoscience lab course was created in correspondence modality to help Rising Scholar students meet associate degree requirements due to limited number of science lab courses for the past 5 years. This addresses Goal 2 of the Palo Verde College Institutional Goals of the Integrated Strategic Plan for Access, Student Success, and Equity.

- b. List and comment on the major weaknesses of the program.

There is a weakness in the Mathematics and Science program that needs to be worked on: Tutors are needed for science subjects in the program.

Update and reinstate Physics Lab classes accepted by the University System in California.

- c. List continuing and new goals. Describe activities to achieve these goals, timelines to complete these goals, and measures for evaluating success in achieving them.

- i. Mathematics and Science division continues to explore open educational resources to further reduce the cost of textbooks to the students. The textbook adoption decision for the rest of the subjects will be finalized once the OER resources become available. These open educational resources will increase access and success for underrepresented and disproportionately impacted students as it will severely reduce the cost of education. By offering both new and accelerated courses, we plan to incorporate Guided Pathways in our division in the next 12 to 18 months (about 1 and a half years).
- ii. Mathematics and Science division have opened four new courses in Biology and Chemistry that will become available for students in the Fall of 2022. These new courses together with the reinstated Physics lab will open the possibilities of STEM degree program that Palo Verde College needs. The STEM degree program will follow the Guided Pathways, open new transfer degrees, and reduce the time needed to complete bachelor's degrees in

Math and Sciences for our students, thus opening more job opportunities for the students. Our division will continue implementing AB-705 by addressing curriculum, assessment, and placement in accordance with the law's guidelines. We will continue to be in compliance with AB 705.

- iii. We will be working for more accessible and dependable tutoring resources/services for the student populations that the division serves.
 - iv. More courses in both Chemistry and Biology, such as Intro to Chemistry without lab and Human Biology without lab can be offered to our correspondence student as the need arises. The necessary lab classes (Intro to Chemistry Lab and Human Biology Lab) can be offered once or twice per year for students that complete the Introductory classes and want to further their education.
 - v. Hire a new Geography instructor to meet demand of correspondence lab courses for Rising Scholar Students that need science lab courses for Associate degree requirements. Current wait for Rising Scholars Students in a geoscience lab course is 1.5 years for local CDCR and greater for statewide CDCR locations. Measurement for success will be shown with a significant increase in student enrollment for correspondence geoscience lab courses. This addresses Goal 1 of the Palo Verde College Institutional Goals of the Integrated Strategic Plan by implementing "programs that serve the needs of our diverse and unique student population and community while increasing growth and student achievement by 1-5% per year for FTES, degree and certificate attainment." In addition, this will address Goal 2 of the PVC Institutional Goals by implementing "strategies to increase access and student success by 1-5% per year with an equity minded focus on underrepresented and disproportionately impacts students" such as our Rising Scholar students.
 - vi. Hire a new Geography instructor, with a GIS specialty, to create a Geographic Information Systems (GIS) certificate program. It is a highly sought-after certificate in the current job market related to all fields of study for mapping purposes such as urban and transportation planning, agriculture, environmental impacts, disaster management, and much more. We will be working on the program planning during 2024-2025 academic year for implementation the following year. New software and computers are needed at this time in an existing computer classroom. Students throughout the state can register in online GIS classes through Palo Verde College. Success of program will be measured with an increase in student enrollment and new certificate program from Palo Verde College. This addresses Goal 3 and 4 of the Palo Verde College Institutional Goals of the Integrated Strategic Plan for "continuous improvements in all program and services" and by developing and optimizing resources and "state-of-the-art technology."
- d. Describe the alignment between continuing and new program goals and institutional goals and objectives stated in the current Integrated Strategic Plan, which can be found on the college website.

Table 4.1 Alignment between continuing and new program goals and institutional goals and objectives stated in the current Integrated Strategic Plan.

Institutional Goals	Division Goals
GOAL 1: Student Achievement and Growth	To increase access and success of students, Mathematics and Science division continues to explore open educational resources to reduce the cost of textbooks to the students.
GOAL 2: Access, Student Success, and Equity	Increase access and success for underrepresented and disproportionately impacted students by offering more lab science courses in a correspondence modality to meet Associate degree requirements within a 2-year timeline.

5. CURRICULUM HISTORY

- a. List all the courses in the program. Of the courses constituting the program, identify those that have not been successfully offered at least once during the preceding six (6) semesters.

Table 5.1 All the courses in the AA with Emphasis in Mathematics and Science program, where x represents courses that were not offered at least once during the preceding six semesters.

AA with Emphasis in Mathematics and Science	x = Not offered in previous 6 semesters
AST 101	
AST 105	
AST 110	
BIO 100	
BIO 101	
BIO 110	
BIO 111	
BIO 140	x
BIO 141	x
BIO 190	*New course Fall 2022
BIO 191	*New course Spring 2023
BIO 210	
BIO 211	
CHE 101	
CHE 108	x
CHE 109	x

CHE 210	x
CHE 211	x
GEO 101	
GEO 1013	
GEO 104	x
GEL 101	
GEL 103	
GEL 105	
GEL 110	x
MAT 106	
MAT 110	
MAT 210	
MAT 220	
PHY 100	*New course Spring 2021
PHY 101	x
PSY 155	

b. Explain in specific terms why these courses were not successfully offered. Provide a strategy for improving their success or explain why they should not be removed from the program.

Table 5.2 Course that were not successfully offered (rows marked x in Table 5.1) are listed here with an explanation and strategy for improvement.

Not offered in previous 6 semesters	Explanation and Strategy for Improvement
BIO 140	Low enrollment Currently not part of any programs or degrees
BIO 141	Low enrollment. It has been inactive as of Fall 2017 Currently not part of any programs or degrees
BIO 110	Will be discontinued as it is replaced by BIO 190 and BIO 191
BIO 190	A new course, transferable and part of most bachelor's degrees in science, better suited for the students' needs, will replace BIO 110 and is offered in the Fall of 2022
BIO 191	A new course, transferable and part of most bachelor's degrees in science, better aligned for the students' needs, will be continuation of BIO 190 and is offered in the Spring of 2023
CHE 108	Low enrollment. Confer with faculty, Instruction Office, and Needles Center whether to inactivate course.
CHE 109	Low enrollment. Confer with faculty, Instruction Office, and Needles Center whether to inactivate course.
CHE 210	Low enrollment. Confer with faculty, Instruction Office, and Needles Center whether to inactivate course.
CHE 211	Low enrollment. Confer with faculty, Instruction Office, and Needles Center whether to inactivate course.
GEO 104	The course was made inactive by mistake and will be activated by Fall 2022 and taught by adjuncts and Anthropology instructor with geography equivalency
GEL 110	Low enrollment. Curriculum modified to increase student interest.
PHY 110	Low enrollment. Confer with faculty, Instruction Office and Needles Center whether to inactivate course.
PHY 220	Low enrollment. Confer with faculty, Instruction Office, and Needles Center whether to inactivate course.

- i. Some courses, especially upper level, should stay active for careers such as medicine, engineering, computer science, mathematics, and science, which require them. The strategy for improving success is to offer courses in a variety of modalities and schedules to accommodate the needs of all types of students.
- ii. Additionally, working on the four pillars of guided pathways:
 - Clarifying the path, onboarding to the path, staying on the path, and meeting learning outcomes along the way is a process to implement system wide changes to the student success at Palo Verde College.

6. COURSE SCHEDULING, and AVAILABILITY

Describe how the scheduling of classes in the program optimizes class availability and supports student success.

Mathematics and Science division offers astronomy, biology, chemistry, geography, geology, mathematics, and physics courses in face-to-face, online, hybrid and correspondence modalities to meet evolving needs of students. The courses are offered in the mornings, afternoons, and evenings in all the modalities to facilitate working and non-working students to take courses in Blythe, Needles, and surrounding communities.

7. STUDENT LEARNING OUTCOMES SLO QUANTITATIVE DATA

Using the Program Level CLO Worksheets, aggregate data annually. Identify all Courses within that Program that have CLOs which map to PLO #1 in the first column of the table below. For each academic year since your last full program review, enter the % of Successful Students for the CLOs that map to PLO #1. Do the same for each PLO within the program.

Table 7.1 Average percent of successful students for each academic year from each course within the AA with Emphasis in Mathematics and Science program that to map to PLO #1. Data is aggregated annually from the Program Level CLO Worksheets. Asterisk () are courses that were not offered, or data is missing or course not part of the program.*

Please go to E-lumen and complete the table below.

Average Percentage Program Learning Outcome #1 AA with Emphasis in Mathematics and Science				
<i>Upon successful completion of the AA, Liberal Arts, Mathematics and Science program students will have: Acquired fundamental grounding in communication, critical thinking, scientific inquiry, and quantitative reasoning, the arts, literature and humanities, social, political, and economic institutions, and self-development.</i>				
Course IDs within the Program that map to PLO#1	% Successful Students 2017-2018	% Successful Students 2018-2019	% Successful Students 2019-2020	% Successful Students 2020-2021
AST 101	87	*	*	*
AST 105	*	*	81.8	*
AST 110	*	*	*	*
BIO 100	54.7	*	41	*

BIO 101	*	70.3	*	*
BIO 110	*	*	87.3	*
BIO 111	*	*	85.3	*
BIO 140	*	*	*	*
BIO 141	*	*	*	*
BIO 210	*	*	86.6	*
BIO 211	*	*	100	*
CHE 101	*	*	76	*
GEO 101	*	82	*	*
GEO 103	*	*	*	*
GEO 104	*	*	*	*
GEL 101	*	*	*	*
GEL 103	*	*	*	*
GEL 105	*	*	74.1	*
GEL 110	*	*	*	*
MAT 106	*	83	*	*
MAT 110	*	*	*	*
MAT 210	67		*	*
MAT 220	*	*	*	*
MAT 224	*	*	*	*
MAT 226	*	*	*	*
PHY 100	*	*	*	*
PHY 101	*	90.5	*	*
Average % of Successful Students by Year	67.5%	76.8%	68.0%	-

Average Percentage Program Learning Outcome #2 AA with Emphasis in Mathematics and Science				
<i>Upon successful completion of the AA, Liberal Arts Mathematics and Science program students will have: Acquired fundamental knowledge and skills in various disciplines constituting the Mathematics and Sciences.</i>				
Course IDs within the Program that map to PLO#2	% Successful Students 2017-2018	% Successful Students 2018-2019	% Successful Students 2019-2020	% Successful Students 2020-2021
AST 101	87.0	*	*	*

AST 105	*	*	81.8	*
AST 110	*	*	*	*
BIO 100	54.7	*	41	*
BIO 101	*	70.3	*	*
BIO 110	*	*	87.3	*
BIO 111	*	*	85.3	*
BIO 140	*	*	*	*
BIO 141	*	*	*	*
BIO 210	*	*	86.6	*
BIO 211	*	*	100	*
CHE 101	*	*	76	*
GEO 101	*	82	*	*
GEO 103	*	*	*	*
GEO 104	*	*	*	*
GEL 101	*	*	*	*
GEL 103	*	*	*	*
GEL 105	*	*	74.1	*
GEL 110	*	*	*	*
MAT 106	*	86	*	*
MAT 110	*	*	*	*
MAT 210	67	*	*	*
MAT 220	*	*	*	*
MAT 224	*	*	*	*
MAT 226	*	*	*	*
PHY 101	*	*	*	*
PHY 110	*	90.5	*	*
Average % of Successful Students by Year	67.5%	76.8%	68.0%	-

From the each of the tables above enter the “AVERAGE % of Successful Students by Year” in the appropriate box below.

Table 7.3 Average percentage of successful students by academic year for each PLO.

Average Percentage for all Program Learning Outcomes For AA with Emphasis in Math and Science				
PROGRAM LEARNING OUTCOME	% Successful Students ACADEMIC YR 1	% Successful Students ACADEMIC YR 2	% Successful Students ACADEMIC YR 3	% Successful Students ACADEMIC YR 4
PLO #1	67.5	76.8	68	-
PLO #2	67.5	76.8	68	-
Average % of Successful Students by Year	67.5	76.8	68	-

SLO ACTION PLANS

In the table below, describe the action plans that your department has made since your last program review. These action plans should be identified in the Program Level CLO Worksheets.

Table 7.4 Action plans identified in the Program Level CLO Worksheets.

Program Name	Associated PLO #	Course IDs Affected	Identified Gap	Action Plan(s)	Resources Used to Implement Plan	Outcome	Academic Year(s) this was addressed
AA	1, 2	BIO 100	The textbook used for reading assignments by correspondence students does not include information on phototropism or hydrotropism.	Correspondence modality will be examined for areas where baseline success may be improved and fill content gaps with other resources.	Biology instructors.	Outcomes to be reviewed during the next program review.	Beginning FA 2022. Improvements are ongoing.

- a. List courses for which CLOs have not been assessed. Provide an explanation why assessments of these CLOs have not been performed.

Courses for which CLOs were not assessed are the following: AST 100, BIO140, BIO 141, GEO 103, GEO 104, GEL 110, MAT 220, MAT 224, MAT 226, and PHY 100. Some of these courses were inactivated.

- b. Were any CLOs or PLOs revised/deleted in the past year based on assessment evaluations or revision of the Course Outline of Record? If so, indicate the courses or the program and a detailed explanation for the changes.

The PLO #2 was revised and updated: Acquired fundamental knowledge and skills in various disciplines constituting the Mathematics and Sciences to be more meaningful.

- c. Provide specific examples of course improvements resulting from the assessment of course SLOs.
 - i. The division of Mathematics and Sciences was not able to determine course improvements of any of the courses listed above, due to the lack of data. Except for BIO-100. All the courses are evaluated every four years (according to the SLOs matrix), but we noticed that most of the courses were highly successful during this period.
- d. Provide specific examples of program and certificate improvements resulting from the assessment of program SLOs.
 - i. The division of Mathematics and Sciences was not able to determine the program and certificate improvements of any of the courses listed above, due to the lack of data. All the courses are evaluated every four years.
- e. Describe any differences in CLO achievement for different modalities (online, ITV, correspondence, face-to-face).

The division of Mathematics and Sciences was not able to complete this section regarding the CLO achievement for different modalities due to the lack of data.

8. COURSE CURRENCY

- a. List the courses in the program and the year in which the course outline of each was most recently reviewed and approved by the Curriculum Committee.

Table 8.1 Year in which the course outline for each course within the AA with Emphasis in Mathematics and Science program was most recently reviewed and approved by the Curriculum Committee.

Course	Committee Approval Date
AGR-120	04/14/2016
AGR-140	04/14/2016
AGR-170	04/14/2016
AST-101	11/14/2019
AST-105	11/14/2019
AST-110	11/14/2019
BIO-100	10/08/2020
BIO-101	10/08/2020
BIO-110	10/08/2020
BIO-111	10/08/2020
BIO-190	05/14/2020

BIO-191	05/14/2020
BIO-210	10/08/2020
BIO-211	10/08/2020
CHE-101	10/08/2020
GEL-101	05/26/2021
GEL 102*	*New course
GEL-103	05/26/2021
GEL 104*	*New course
GEL-105	05/26/2021
GEL 106*	*New course
GEL-110	07/01/2020
GEO 101/GGR 101	05/26/2021
GGR 102*	*New course
GEO 103/GGR 103	
GEO 104/GGR 104	
MAT-106	10/08/2020
MAT-108	10/08/2020
MAT-110	03/19/2020
MAT-210	04/14/2016
MAT-220	12/11/2014
PHY-100	11/14/2019
PSY-155	04/16/2020

b. Describe plans to revise and update course outlines of record that have not been reviewed and approved by the Curriculum Committee within the three (3) years preceding this program review report.

The plans to revise and update the course outlines of record are the following:

- i. BIO 190 and BIO 191 are updated and submitted to the Curriculum Committee for review and are to be approved. They have been completely approved October 2020
- ii. BIO 110 has been offered during the preceding six (6) semesters, but it will be inactivated as of Fall 2022.

ii. CHE 109, CHE 210, and CHE 211 are to be reinstated. The Course outlines have been revised and approved by the Curriculum Committee. Submitted for articulation and pending approval.

PROGRAM AND COURSE COVERAGE

a. List the courses in the program and identify which are taught by full-time faculty only, which are taught by adjunct faculty only, and which are taught by both.

Table 9.1 Course within the AA with Emphasis in Mathematics and Science program that were taught by full-time, adjunct, and both faculty.

Course IDs	Full-Time Only	Adjunct Only	Both Full-Time and Adjunct
AST 101			1
AST 105			1
AST 110	1		
BIO 100			1
BIO 101	1		
BIO 110	1		
BIO 111	1		
BIO 190	1		
BIO 191	1		
BIO 210	1		
BIO 211	1		
CHE 101	1		
GEL 101			1
GEL 103	1		
GEL 105			1
GEO 101			1
GEO 103		1	
MAT 106	1		
MAT 110	1		
MAT 210	1		
MAT 220	1		
PHY 100	1		
PHY 101	1		
PSY 155			1
Total	12	1	7

b. Explain how effectively the program is served with the current coverage.

Out of nineteen (19) courses taught, 63.2% were taught by full-time faculty, , and 36.8% of the courses were taught by both adjunct and fulltime faculty. Full-time faculty taught overload to meet the demand. Overall, the total coverage was 100% out of all the courses that were offered.

c. Describe plans to correct deficiencies, if any, in course and program coverage.

The current full time and adjunct faculty within the Division of Math and Science provide sufficient coverage for the courses.

Propose hiring a full-time Geography instructor to meet the demand for correspondence science lab courses to meet Associate Degree requirements for Rising Scholar Students within a 2-year timeline. This new hire proposal addresses Palo Verde College Institutional Goals of the Integrated Strategic Plan: Goal 1 for Student Achievement and Goal 2 for Growth and Access, Student Success, and Equity.

9. PROFESSIONAL DEVELOPMENT

a. Describe specific professional development activities in which faculty members in the program have participated over the past three (3) years and explain how such activities benefited the program and supported and facilitated student learning outcomes.

- i. Instructors: Chaminda Hettige, Jorge Martinez, Alberto Edranda, Paul Shibalovich, Vanja Velickovska, Nidhi Patel, and Rosa Martin have attended the @ONE Training, the Unconscious Bias Training, and also attended SLO and eLumen trainings for faculty.
- ii. Chaminda Hettige, Jorge Martinez, and Vanja Velickovska have participated in the 2021 Summer Curriculum Institute.
- iii. Rosa Martin will be participating in a regional meeting of the Geological Society of America in March 2022. The conference will help the instructor keep up to date with geological research and gain ideas to incorporate into teaching and ideas for the creation of future geoscience courses. Geology SLOs relate to current theories on the formation of the Earth, how particular environments form and change, how geology influences where it is safe to live, and how geologists understand the past (current research) by studying the present landscape, rocks, and fossils. This conference will be an annual or bi-annual event to stay up to date with geological research and modifying instruction to help students meet SLOs in geology. These conferences help meet Goal 3 and 5 of the Palo Verde College Institutional Goals of the Integrated Strategic Plan for continuous improvement of program and professional development.

b. Describe areas of unmet professional development needs among faculty in the program and identify specifically plans to address those needs.

The following are unmet professional development needs among the full-time faculty of the Math & Science Division. These needs address Goal 5 of the Palo Verde College Institutional Goals of the Integrated Strategic Plan for Collegiality and Development.

- i. Dr. Patel would like to become member of American Physical Society (APS), American Astronomical Society, and American Association of Physics Teachers. Becoming a member in these organization will help Dr. Patel keep abreast with current research in physical sciences and its applications as well as physics education, and careers in science

and engineering professions. An annual fee is required for membership in each of these organization.

- ii. Dr. Velickovska would like to continue her professional development by being an active member of the National Association of Biology Teachers (NABT), National Science Teacher Association (NSTA), Association for Science Education, The Cell, Journal of Comparative Biology, Science, and Cryobiology. Being an active member of these organizations keeps Dr. Velickovska current with all the newest developments in Biology and Science so she can continue providing the best for the Palo Verde College students. Annual fee is required for membership in each of these organizations.
- iii. Instructor Jorge Martinez would like to continue his professional development by being an active member of the following organizations, National Association of Biology Teachers and The Human and Physiology Society, all of which require an annual fee to claim the benefits. Membership would ensure Instructor Martinez remains up to date with the latest developments in science to provide the students at Palo Verde College with the most current knowledge in science and science fields
- iv. Dr. Chaminda Hettige would like to continue his professional development by being an active member of the following organizations: American Chemical Society and the Electrochemical society, all of which require an annual fee to claim the benefits. Through the membership of American Chemical society, he has access to the Journal of Chemical Education, and related workshops, that enhance the knowledge and skills in current trends in chemical education.
- v. Instructor Rosa Martin would like to continue her professional development as an active member of the National Association of Geoscience Teachers (NAGT) and the Geological Society of America (GSA). An annual fee is required for membership in each organization.

10. STUDENT SUCCESSFUL COMPLETION & RETENTION

*Note: The Program Review Committee will research the required completion and retention data and provide it to program faculty members for their review and analysis for this report. **Completion** is defined as number of grades of A,B,C,CR divided by A,B,C,D,F,CR,NC,W,MW,IP. **Retention** is defined as number of grades of A,B,C,D,F,CR,NC, MW,IP divided by A,B,C,D,F,CR,NC,W,MW,IP*

- a. Assess semester-by-semester course completion performance in each course in the program over the preceding eight (8) semesters and compare those rates with the Institutional Set standards.

The Current Institutional Set Standard for Completion is: 73.5%

Year	2017-2018
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Year	2017-2018
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Completion		
	2017FA	2018SP
AGR-120	-	100%

Completion			
	Corres	F2F	Online
AGR-120	-	100%	100%

AGR-140	-	86%
AGR-170	86%	-
AST-101	79%	88%
AST-105	80%	93%
AST-110	-	90%
BIO-100	42%	44%
BIO-101	75%	58%
BIO-110	75%	-
BIO-111	-	77%
BIO-210	89%	-
BIO-211	-	100%
CHE-101	69%	57%
GEL-101	-	77%
GEL-103	69%	-
GEL-105	47%	47%
GEO-101	70%	54%
GEO-103	-	-
MAT-106	59%	83%
MAT-108	-	-
MAT-110	71%	78%
MAT-210	40%	-
MAT-220	-	43%
PHY-101	93%	-
PSY-155	80%	-

AGR-140	-	86%	86%
AGR-170	-	86%	86%
AST-101	83%	-	-
AST-105	85%	-	-
AST-110	90%	-	-
BIO-100	40%	42%	59%
BIO-101	-	67%	-
BIO-110	-	75%	-
BIO-111	-	77%	-
BIO-210	-	89%	-
BIO-211	-	100%	-
CHE-101	-	65%	-
GEL-101	-	-	77%
GEL-103	-	-	69%
GEL-105	47%	-	-
GEO-101	61%	-	-
GEO-103	-	-	-
MAT-106	59%	83%	-
MAT-108	-	-	-
MAT-110	84%	48%	-
MAT-210	40%	-	-
MAT-220	43%	-	-
PHY-101	93%	-	-
PSY-155	80%	-	-

Year	2018-2019	
Completion		
	2018FA	2019SP
AGR-120	-	50%
AGR-140	-	100%

Year	2018-2019		
Completion			
	Corres	F2F	Online
AGR-120	-	50%	50%
AGR-140	-	100%	-

AGR-170	60%	-
AST-101	88%	-
AST-105	56%	59%
AST-110	86%	85%
BIO-100	49%	62%
BIO-101	53%	74%
BIO-110	79%	-
BIO-111	-	78%
BIO-210	81%	-
BIO-211	-	100%
CHE-101	-	-
GEL-101	50%	48%
GEL-103	-	-
GEL-105	87%	47%
GEO-101	62%	58%
GEO-103	-	-
MAT-106	67%	88%
MAT-108	-	-
MAT-110	50%	47%
MAT-210	63%	-
MAT-220	-	67%
PHY-101	59%	55%
PSY-155	-	92%

AGR-170	-	60%	60%
AST-101	88%	-	-
AST-105	57%	-	-
AST-110	85%	-	-
BIO-100	53%	57%	66%
BIO-101	-	64%	-
BIO-110	-	79%	-
BIO-111	-	78%	-
BIO-210	-	81%	-
BIO-211	-	100%	-
CHE-101	-	-	-
GEL-101	30%	-	57%
GEL-103	-	-	-
GEL-105	47%	-	87%
GEO-101	59%	-	-
GEO-103	-	-	-
MAT-106	67%	88%	-
MAT-108	-	-	-
MAT-110	54%	28%	-
MAT-210	63%	-	-
MAT-220	67%	-	-
PHY-101	57%	-	-
PSY-155	92%	-	-

Year	2019-2020	
Completion		
	2019FA	2020SP
AGR-120	-	30%
AGR-140	75%	-
AGR-170	80%	-

Year	2019-2020		
Completion			
	Corres	F2F	Online
AGR-120	-	30%	30%
AGR-140	-	75%	-
AGR-170	-	80%	80%

AST-101	-	71%
AST-105	21%	27%
AST-110	43%	23%
BIO-100	66%	69%
BIO-101	73%	88%
BIO-110	94%	-
BIO-111	-	94%
BIO-210	95%	-
BIO-211	-	100%
CHE-101	71%	76%
GEL-101	64%	-
GEL-103	-	-
GEL-105	54%	59%
GEO-101	44%	70%
GEO-103	33%	-
MAT-106	34%	26%
MAT-108	28%	88%
MAT-110	41%	43%
MAT-210	67%	-
MAT-220	-	67%
PHY-101	-	-
PSY-155	96%	80%

AST-101	71%	-	-
AST-105	23%	-	-
AST-110	37%	-	-
BIO-100	67%	69%	74%
BIO-101	-	81%	-
BIO-110	-	94%	-
BIO-111	-	94%	-
BIO-210	-	95%	-
BIO-211	-	100%	-
CHE-101	-	73%	-
GEL-101	-	64%	-
GEL-103	-	-	-
GEL-105	58%	-	50%
GEO-101	63%	39%	18%
GEO-103	33%	-	-
MAT-106	24%	33%	-
MAT-108	-	46%	-
MAT-110	42%	39%	-
MAT-210	67%	-	-
MAT-220	67%	-	-
PHY-101	-	-	-
PSY-155	85%	-	-

Year	2020-2021	
Completion	2020FA	2021SP
AGR-120	-	-
AGR-140	-	-
AGR-170	-	-
AST-101	77%	66%

Year	2020-2021		
Completion	Corres	F2F	Online
AGR-120	-	-	-
AGR-140	-	-	-
AGR-170	-	-	-
AST-101	71%	-	-

AST-105	81%	56%
AST-110	14%	23%
BIO-100	76%	61%
BIO-101	100%	76%
BIO-110	77%	-
BIO-111	-	95%
BIO-210	100%	-
BIO-211	-	88%
CHE-101	69%	92%
GEL-101	-	72%
GEL-103	-	-
GEL-105	42%	44%
GEO-101	60%	79%
GEO-103	62%	56%
MAT-106	45%	44%
MAT-108	88%	69%
MAT-110	57%	66%
MAT-210	78%	100%
MAT-220	-	86%
PHY-100	-	-
PHY-101	-	-
PSY-155	89%	86%

AST-105	77%	-	-
AST-110	20%	-	-
BIO-100	70%	69%	52%
BIO-101	-	100%	76%
BIO-110	-	77%	-
BIO-111	-	-	95%
BIO-210	-	100%	-
BIO-211	-	-	88%
CHE-101	-	69%	92%
GEL-101	-	-	72%
GEL-103	-	-	-
GEL-105	43%	-	-
GEO-101	79%	-	39%
GEO-103	58%	-	-
MAT-106	44%	-	-
MAT-108	80%	-	40%
MAT-110	62%	-	-
MAT-210	78%	100%	-
MAT-220	86%	-	-
PHY-100	-	-	-
PHY-101	-	-	-
PSY-155	88%	-	-

While we observed that most of the Mathematics and Sciences courses have not met the Current Institutional Set Standard for course completion, there is a steady improvement towards the set standard goal. We cannot make a complete analysis of data since there has been an instructor for Biology, Chemistry, and Geology for several years and the courses have not been offered. Since new instructors were hired in 2019, remarkable improvements have been observed.

- b. Assess semester-by-semester course retention performance in each course in the program over the preceding eight (8) semesters.

The Current Institutional Set Standard for Retention is: 87.0%

Year	2017-2018
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Year	2017-2018
------	-----------

Retention		
	2017FA	2018SP
AGR-120	-	100%
AGR-140	-	100%
AGR-170	86%	-
AST-101	90%	100%
AST-105	96%	97%
AST-110	-	93%
BIO-100	83%	77%
BIO-101	100%	67%
BIO-110	88%	-
BIO-111	-	77%
BIO-210	100%	-
BIO-211	-	100%
CHE-101	69%	100%
GEL-101	-	92%
GEL-103	100%	-
GEL-105	73%	74%
GEO-101	91%	78%
GEO-103	-	-
MAT-106	79%	100%
MAT-108	-	-
MAT-110	84%	92%
MAT-210	60%	-
MAT-220	-	57%
PHY-101	97%	-
PSY-155	100%	-

Retention			
	Corres	F2F	Online
AGR-120	-	100%	100%
AGR-140	-	100%	100%
AGR-170	-	86%	86%
AST-101	94%	-	-
AST-105	96%	-	-
AST-110	93%	-	-
BIO-100	77%	84%	84%
BIO-101	-	83%	-
BIO-110	-	88%	-
BIO-111	-	77%	-
BIO-210	-	100%	-
BIO-211	-	100%	-
CHE-101	-	78%	-
GEL-101	-	-	92%
GEL-103	-	-	100%
GEL-105	74%	-	-
GEO-101	84%	-	-
GEO-103	-	-	-
MAT-106	79%	100%	-
MAT-108	-	-	-
MAT-110	92%	74%	-
MAT-210	60%	-	-
MAT-220	57%	-	-
PHY-101	97%	-	-
PSY-155	100%	-	-

Year	2018-2019
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Year	2018-2019
------	-----------

Retention	2018FA	2019SP
AGR-120	-	75%
AGR-140	-	100%
AGR-170	80%	-
AST-101	96%	-
AST-105	88%	72%
AST-110	96%	96%
BIO-100	75%	83%
BIO-101	82%	79%
BIO-110	93%	-
BIO-111	-	83%
BIO-210	100%	-
BIO-211	-	100%
CHE-101	-	-
GEL-101	88%	68%
GEL-103	-	-
GEL-105	100%	53%
GEO-101	85%	74%
GEO-103	-	-
MAT-106	74%	91%
MAT-108	-	-
MAT-110	82%	66%
MAT-210	81%	-
MAT-220	-	83%
PHY-101	86%	75%
PSY-155	-	92%

Retention	Corres	F2F	Online
AGR-120	-	75%	75%
AGR-140	-	100%	-
AGR-170	-	80%	80%
AST-101	96%	-	-
AST-105	78%	-	-
AST-110	96%	-	-
BIO-100	80%	76%	82%
BIO-101	-	81%	-
BIO-110	-	93%	-
BIO-111	-	83%	-
BIO-210	-	100%	-
BIO-211	-	100%	-
CHE-101	-	-	-
GEL-101	45%	-	89%
GEL-103	-	-	-
GEL-105	53%	-	100%
GEO-101	78%	-	-
GEO-103	-	-	-
MAT-106	74%	91%	-
MAT-108	-	-	-
MAT-110	74%	69%	-
MAT-210	81%	-	-
MAT-220	83%	-	-
PHY-101	81%	-	-
PSY-155	92%	-	-

Year	2019-2020
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Year	2019-2020
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Retention	2019FA	2020SP
AGR-120	-	50%
AGR-140	100%	-
AGR-170	100%	-
AST-101	-	91%
AST-105	45%	55%
AST-110	53%	23%
BIO-100	85%	82%
BIO-101	100%	94%
BIO-110	100%	-
BIO-111	-	94%
BIO-210	100%	-
BIO-211	-	100%
CHE-101	82%	90%
GEL-101	91%	-
GEL-103	-	-
GEL-105	70%	84%
GEO-101	71%	79%
GEO-103	67%	-
MAT-106	78%	53%
MAT-108	67%	88%
MAT-110	61%	70%
MAT-210	83%	-
MAT-220	-	67%
PHY-101	-	-
PSY-155	96%	82%

Retention	Corres	F2F	Online
AGR-120	-	50%	50%
AGR-140	-	100%	-
AGR-170	-	100%	100%
AST-101	91%	-	-
AST-105	48%	-	-
AST-110	44%	-	-
BIO-100	84%	91%	80%
BIO-101	-	96%	-
BIO-110	-	100%	-
BIO-111	-	94%	-
BIO-210	-	100%	-
BIO-211	-	100%	-
CHE-101	-	85%	-
GEL-101	-	91%	-
GEL-103	-	-	-
GEL-105	80%	-	75%
GEO-101	85%	44%	29%
GEO-103	67%	-	-
MAT-106	76%	61%	-
MAT-108	-	73%	-
MAT-110	64%	79%	-
MAT-210	83%	-	-
MAT-220	67%	-	-
PHY-101	-	-	-
PSY-155	86%	-	-

Year	2020-2021
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Year	2020-2021
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Retention	2020FA	2021SP
AGR-120	-	-
AGR-140	-	-
AGR-170	-	-
AST-101	89%	74%
AST-105	91%	89%
AST-110	71%	62%
BIO-100	90%	88%
BIO-101	100%	94%
BIO-110	95%	-
BIO-111	-	100%
BIO-210	100%	-
BIO-211	-	94%
CHE-101	77%	100%
GEL-101	-	89%
GEL-103	-	-
GEL-105	84%	83%
GEO-101	84%	90%
GEO-103	69%	64%
MAT-106	78%	65%
MAT-108	92%	80%
MAT-110	84%	82%
MAT-210	89%	100%
MAT-220	-	86%
PHY-101	-	-
PSY-155	91%	90%

Retention	Corres	F2F	Online
AGR-120	-	-	-
AGR-140	-	-	-
AGR-170	-	-	-
AST-101	81%	-	-
AST-105	91%	-	-
AST-110	65%	-	-
BIO-100	89%	81%	85%
BIO-101	-	100%	94%
BIO-110	-	95%	-
BIO-111	-	-	100%
BIO-210	-	100%	-
BIO-211	-	-	94%
CHE-101	-	77%	100%
GEL-101	-	-	89%
GEL-103	-	-	-
GEL-105	84%	-	-
GEO-101	88%	-	83%
GEO-103	66%	-	-
MAT-106	71%	-	-
MAT-108	86%	-	70%
MAT-110	83%	-	-
MAT-210	89%	100%	-
MAT-220	86%	-	-
PHY-101	-	-	-
PSY-155	90%	-	-

Average Institutional Retention for Palo Verde College (87%) is used to analyze course retention for the 2017 – 2021 period shown.

Retention is primarily a measure of the rate at which students have received a W in a course (withdrawals after the drop period and before the withdrawal period closes). Most of the courses within the division of mathematics and sciences have shown retention rates fluctuating throughout the evaluation period. The only course meeting or exceeding the Palo Verde Institutional Average for retention is PHY 155. Despite the fact mentioned above, we noticed an overall improvement in the retention rates.

- c. Indicate the number of annual awards over the preceding four (4) years and assess trends in the number of program certificates and degrees awarded.

Table 11.7 The number of AA with Emphasis in Mathematics and Science degrees awarded annually over the preceding three years.

Name of Award	2017-18	2018-19	2019-20	2020-21
AA, Liberal Arts, emphasis in Mathematics and Science	37	27	45	25

The 2019 – 2020 academic year exhibited a high number of AA degrees with Emphasis in Mathematics and Science. Since this spike, the number of degrees for this program has shown a decline, especially in the academic year 2020-21. The decline in AA degrees with Emphasis in Mathematics and Science may be a result of students pursuing other careers or an increase in students who transfer to other institutions, but most importantly due to the Covid-19 pandemic.

11. ENROLLMENT TRENDS

Note: The Program Review Committee will research the required enrollment data and provide it to program faculty members for their review and analysis for this report.

Year	2017-2018
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Year	2017-2018
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Enrollment	2017FA	2018SP
AGR-120	-	10
AGR-140	-	14
AGR-170	14	-
AST-101	29	24
AST-105	55	29
AST-110	-	29
BIO-100	149	184
BIO-101	12	12
BIO-110	8	-

Enrollment	Corres	F2F	Online
AGR-120	-	5	5
AGR-140	-	7	7
AGR-170	-	7	7
AST-101	53	-	-
AST-105	84	-	-
AST-110	29	-	-
BIO-100	232	50	51
BIO-101	-	24	-
BIO-110	-	8	-

BIO-111	-	13
BIO-210	18	-
BIO-211	-	28
CHE-101	16	7
GEL-101	-	26
GEL-103	13	-
GEL-105	15	19
GEO-101	43	50
GEO-103	-	-
MAT-106	29	24
MAT-108	-	-
MAT-110	49	37
MAT-210	15	-
MAT-220	-	7
PHY-101	29	-
PSY-155	15	-

BIO-111	-	13	-
BIO-210	-	18	-
BIO-211	-	28	-
CHE-101	-	23	-
GEL-101	-	-	26
GEL-103	-	-	13
GEL-105	34	-	-
GEO-101	93	-	-
GEO-103	-	-	-
MAT-106	29	24	-
MAT-108	-	-	-
MAT-110	63	23	-
MAT-210	15	-	-
MAT-220	7	-	-
PHY-101	29	-	-
PSY-155	15	-	-

Year	2018-2019
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Year	2018-2019
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Enrollment		
	2018FA	2019SP
AGR-120	-	8
AGR-140	-	1
AGR-170	10	-
AST-101	26	-
AST-105	52	82
AST-110	28	26
BIO-100	161	272
BIO-101	17	19
BIO-110	14	-

Enrollment			
	Corres	F2F	Online
AGR-120	-	4	4
AGR-140	-	1	-
AGR-170	-	5	5
AST-101	26	-	-
AST-105	134	-	-
AST-110	54	-	-
BIO-100	271	37	125
BIO-101	-	36	-
BIO-110	-	14	-

BIO-111	-	18
BIO-210	16	-
BIO-211	-	14
CHE-101	-	-
GEL-101	24	40
GEL-103	-	-
GEL-105	15	19
GEO-101	52	101
GEO-103	-	-
MAT-106	27	33
MAT-108	-	-
MAT-110	66	87
MAT-210	16	-
MAT-220	-	6
PHY-101	22	20
PSY-155	-	24

BIO-111	-	18	-
BIO-210	-	16	-
BIO-211	-	14	-
CHE-101	-	-	-
GEL-101	20	-	44
GEL-103	-	-	-
GEL-105	19	-	15
GEO-101	153	-	-
GEO-103	-	-	-
MAT-106	27	33	-
MAT-108	-	-	-
MAT-110	121	32	-
MAT-210	16	-	-
MAT-220	6	-	-
PHY-101	42	-	-
PSY-155	24	-	-

Year	2019-2020
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Year	2019-2020
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Enrollment		
	2019FA	2020SP
AGR-120	-	20
AGR-140	4	-
AGR-170	10	-
AST-101	-	34
AST-105	29	11
AST-110	30	13
BIO-100	186	238
BIO-101	11	16
BIO-110	17	-

Enrollment			
	Corres	F2F	Online
AGR-120	-	10	10
AGR-140	-	4	-
AGR-170	-	5	5
AST-101	34	-	-
AST-105	40	-	-
AST-110	43	-	-
BIO-100	335	35	54
BIO-101	-	27	-
BIO-110	-	17	-

BIO-111	-	17
BIO-210	19	-
BIO-211	-	15
CHE-101	34	21
GEL-101	11	-
GEL-103	-	-
GEL-105	37	81
GEO-101	85	70
GEO-103	15	-
MAT-106	59	57
MAT-108	18	8
MAT-110	138	150
MAT-210	6	-
MAT-220	-	3
PHY-101	-	-
PSY-155	26	61

BIO-111	-	17	-
BIO-210	-	19	-
BIO-211	-	15	-
CHE-101	-	55	-
GEL-101	-	11	-
GEL-103	-	-	-
GEL-105	110	-	8
GEO-101	120	18	17
GEO-103	15	-	-
MAT-106	37	79	-
MAT-108	-	26	-
MAT-110	260	28	-
MAT-210	6	-	-
MAT-220	3	-	-
PHY-101	-	-	-
PSY-155	87	-	-

Year	2020-2021
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Year	2020-2021
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Enrollment		
	2020FA	2021SP
AGR-120	-	-
AGR-140	-	-
AGR-170	-	-
AST-101	35	35
AST-105	57	9
AST-110	7	13
BIO-100	245	221
BIO-101	3	17
BIO-110	22	-

Enrollment			
	Corres	F2F	Online
AGR-120	-	-	-
AGR-140	-	-	-
AGR-170	-	-	-
AST-101	70	-	-
AST-105	66	-	-
AST-110	20	-	-
BIO-100	423	16	27
BIO-101	-	3	17
BIO-110	-	22	-

BIO-111	-	21
BIO-210	16	-
BIO-211	-	17
CHE-101	13	25
GEL-101	-	18
GEL-103	-	-
GEL-105	88	106
GEO-101	50	29
GEO-103	13	25
MAT-106	67	66
MAT-108	24	55
MAT-110	128	136
MAT-210	9	1
MAT-220	-	7
PHY-101	-	-
PSY-155	113	96

BIO-111	-	-	21
BIO-210	-	16	-
BIO-211	-	-	17
CHE-101	-	13	25
GEL-101	-	-	18
GEL-103	-	-	-
GEL-105	194	-	-
GEO-101	56	-	23
GEO-103	38	-	-
MAT-106	133	-	-
MAT-108	69	-	10
MAT-110	264	-	-
MAT-210	9	1	-
MAT-220	7	-	-
PHY-101	-	-	-
PSY-155	209	-	-

In general, math and science enrollments are high and remain high, in part due to the general education requirements in demand from the correspondence populations for correspondence courses evidenced by high enrollment in correspondence courses, particularly for biology, geography, and math. Course enrollment trends exhibit either steady or increasing enrollment.

Face to face, correspondence and online science and math classes were offered during this period. However, with the current pandemic, online education enrollment had increased, but we observed that face to face courses show higher enrollment rates.

12. FINANCIAL TRENDS

Comment on annual budgeted-vs.-actual program expenditures for each of the preceding five (5) years as to personnel salaries, benefits, supplies, contract services, capital outlay and other expenditures. Explain deviations from budget exceeding 10% of any line item. Describe plans for future budget changes.

	FY 2018		FY 2019		FY 2020		FY 2021	
	BUDGETED	EXPENDED	BUDGETED	EXPENDED	BUDGETED	EXPENDED	BUDGETED	EXPENDED
AST								
Salaries	61,798.00	60,969.93	60,353.00	67,273.85	59,836.80	59,836.80	83,587.60	83,587.60
Benefits	32,852.00	23,154.73	23,698.00	27,159.26	32,194.97	32,194.97	27,684.56	27,684.56

Overload Salaries	0.00	14,361.84	0.00	16,230.37	7,619.61	7,619.61	8,140.66	8,140.66
Overload Benefits	0.00	2,526.10	0.00	3,149.30	1,536.85	1,536.85	1,566.44	1,566.44
BIO								
0401	165,393.00	177,394.10	157,505.53	189,422.70	197,537.76	197,537.76	181,200.20	181,200.20
	82,427.00	67,379.04	76,719.47	76,719.47	73,401.24	73,401.24	74,202.62	74,202.62
	0.00	36,709.03	0.00	28,562.39	22,469.16	22,469.16	31,678.85	31,678.85
	0.00	6,448.04	0.00	5,537.75	4,535.84	4,535.84	6,093.53	6,093.53
CHE								
1905	27,269.00	27,694.31	0.00	0.00	83,909.00	83,909.00	81,535.08	81,535.08
	10,097.00	10,102.89	0.00	633.39	32,072.80	32,072.80	33,168.25	33,168.25
	0.00	1,079.10	0.00	16.83	0.00	0.00	1,604.94	1,604.94
	0.00	189.41	0.00	3.26	0.00	0.00	310.97	310.97
GEL								
1914	0.00	16,464.12	0.00	9,700.74	59,852.05	59,852.05	74,949.23	74,949.23
	0.00	1,540.85	0.00	3,351.28	26,053.58	26,053.58	35,784.76	35,784.76
	0.00	0.00	0.00	3,069.90	5,573.60	5,573.60	264.82	264.82
	0.00	0.00	0.00	594.07	1,119.36	1,119.36	51.04	51.04
GEO								
2206	0.00	34,556.28	0.00	75,313.21	52,404.64	52,404.64	26,940.59	26,940.59
	0.00	6,078.09	0.00	11,078.18	18,501.31	18,501.31	6,242.14	6,242.14
	0.00	0.00	0.00	0.00	706.18	706.18	537.65	537.65
	0.00	0.00	0.00	0.00	142.36	142.36	103.62	103.62
MAT								
1701	334,576.00	351,459.51	297,927.22	293,257.29	222,893.83	222,893.83	220,433.20	220,433.20
	143,844.00	138,514.83	124,819.78	124,819.78	93,467.08	93,467.08	70,244.86	70,244.86
	0.00	58,232.16	0.00	55,525.85	34,865.28	34,865.28	28,131.12	28,131.12
	0.00	10,236.38	0.00	10,771.93	7,009.24	7,009.24	5,407.37	5,407.37
PHS								
n/a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PHY								
1902	20,599.00	12,552.30	0.00	13,554.85	0.00	0.00	3,430.92	3,430.92
	7,037.00	5,096.02	0.00	5,768.21	1,328.98	1,328.98	1,232.77	1,232.77

	0.00	1,373.40	0.00	3,889.50	0.00	0.00	1,073.04	1,073.04
	0.00	241.56	0.00	754.66	0.00	0.00	206.16	206.16
SCI								
n/a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 13.1 Annual budgeted versus actual program expenditures for each of the preceding five (5) years.

In the future, division chair will assist faculty, when needed, to appropriately budget funds for overload salaries, overload benefits, copying, and supplies based on the past expenditures.

13. FACILITIES AND EQUIPMENT

- a. Are current facilities, such as classrooms, offices, and equipment adequate to support the program? Explain.
- i. Laboratory equipment and supplies needed for the implementation of hands-on Biology laboratory learning continue to be updated. Currently, microscopes, incubator, water bath, electrophoresis chambers, micropipettes, wages, and thermometers are used regularly to perform the labs in the current classes offered by Palo Verde College. CO₂ and O₂ probes, as well as Bunsen burners, centrifuge tubes, Durham tubes, glassware agar plates and models are used for the microbiology laboratories. In addition, the library of microscopic slides, and chemical reagents, as well as necessary bacterial cultures needed are updated every semester as the demands of the laboratory increases to provide better education to the students enrolled in the biology lab classes. It should be noted that maintenance of the current equipment (the microscope) might require servicing and /or replacement to ensure the good functioning of the current equipment. Also, glassware that will eventually break will need to be replaced as well as some of the disposable items such as chemical reagents and bacterial cultures will need to be regularly updated to ensure excellent quality lab practices in both Biology and Microbiology laboratories.
 - ii. No. The current geoscience classroom is shared with multiple instructors that have seniority for their schedules and limits the time and day available. The current geoscience shared classroom is ideal with access to sinks for wet labs and cabinets for geoscience storage. The connected room is not ideal as an office space and modifications on room are requested.
 - iii. In addition to classrooms and offices, the current facilities used by MAT courses also include computer software and peripheral devices. Software licenses must be renewed whenever the latest version of the software is available. Various computer software, such as Microsoft Office and Hawkes Learning Software, are used to prepare lectures, assign homework, and administer exams. In addition, peripheral devices such as a Wacom tablet are an essential tool to effectively communicate ideas covered in lectures.

- iv. Chemistry program has recently acquired an analytical balance, a UV visible spectrophotometer, a centrifuge, and several hotplates/stirrers. As the program will expand to teach higher level chemistry courses it will require an FTIR instrument and gas chromatography instrumentation. Further these instruments can be shared between agriculture, biology and other disciplinary areas that require training in innovative technology. Consumable chemical reagents and other supplies will be required for the current program as well as proposed new chemistry programs.
- b. Describe plans for future changes in facilities or equipment that would better support the program.

- i. As the equipment and supplies have been steadily updated and replaced in the biology laboratories, it is important to note that both maintenance and constant supplies of essential items (glassware, chemical reagents, biological media, bacterial cultures, etc.) will need to be maintained for successful laboratory practices. The current full-time faculty do monitor and update as required everything needed for the labs and will continue doing so.

In case PVC needs to return to remote learning modality due to events such as COVID-19 pandemic, it would be beneficial to have Zoom accounts for faculty, which removes limitation on the length of meeting.

Additionally, to maintain student-centered learning in Biology lectures, classroom clickers would be a welcome addition to Biology classrooms. Clickers are devices students pick up at the beginning of class that allows them to answer multiple choice questions asked during the lecture. A student clicks A, B, C, D, or E to choose the answer they believe to be correct, and the answers given by students are anonymously tabulated with a software program. This is an excellent tool to keep students engaged during lectures, to assess student learning and understanding, and to clear up misconceptions.

- ii. Propose a geoscience classroom that is not shared with too many instructors to be able to offer additional course times and addresses Goal 5 of the Palo Verde College Institutional Goals of the Integrated Strategic Plan for Collegiality and Development. In addition, I request that the connected room be modified as an office instead of a storage room with a sink.
- iii. Geoscience lab equipment and supplies break or become worn and will need to be replaced. These items include rock and mineral testing kits, maps, beakers, graduated cylinders, 10% hydrochloric acid, dropper bottles, storage boxes/containers, stereo nets, psychrometers, drawing compasses, protractors, rulers, colored pencils, and wet-erase markers. This will address Goal 3 of the Palo Verde College Institutional Goals of the Integrated Strategic Plan for “continuous improvements in all programs and services.”
- iv. To address Goal 4 of the Palo Verde College Institutional Goals of the Integrated Strategic Plan of using state-of-the art technology, the geoscience department will request GPS devices for mapping and surveying activities and the purchase of ArcGIS software and possible new computers for future GIS courses for a new certificate program.

- v. The Geoscience department also requests clicker devices to enhance student-centered learning in a face-to-face classroom setting. This addresses Goal 2 of the Palo Verde College Institutional Goals of the Integrated Strategic Plan for strategies to increase access and student success. In spring 2020, student participation increased from F2F classroom lecture to online live lecture setting with poll questions in which students were able to answer multiple choice questions anonymously. This ungraded assessment tool encourages student engagement, can be used to prepare students for upcoming exams, to enhance student learning by clearing up any misunderstanding of course material. This is like weekly assessment quizzes for online courses as recommended by the @ONE Teaching and Design training course.
- vi. To address the mandate of implementing AB 705 such that all incoming students will be placed in college level math with adequate co-requisite support, a new curriculum has been developed that will address all student deficiencies.
- vii. The Math Department began offering a lab-based course, NBE 098, starting Fall of 2019 that provided supplementary support for transferable Math courses. However, due to low enrolment the course did not make, because students preferred to get tutoring with flexible hours.
- viii. With the expansion of the chemistry program, it will seek to acquire chemistry modelling software, in addition to teaching lab instrumentation (pH meters, and modern lab equipment such as thermometers and conductivity meters relying on computers and data acquisitions system). To support the use of such equipment, several dedicated laptop computers will be required.