

PALO VERDE COLLEGE

Program Review

Astronomy/Physics

Presented by Alejandro Garcia

2011-2012

EXECUTIVE SUMMARY

Astronomy/Physics

1. Program Strengths:

- a. Faculty involvement in the Colorado River Astronomy Club and other community events related to astronomy.
- b. Commitment by faculty to implement student learning outcomes assessment methods. In both astronomy and physics.

2. Program Weaknesses:

The enrollments in physics sections are low, and PHY 101 is offered only sporadically

3. Recommendations for Program Improvement:

- a. Research the feasibility of an online physics course and lab.
- b. Continue efforts to evaluate student learning outcomes to improve student learning and success.

4. Committee Determination:

Report is accepted and may proceed to the next step in the process.

Program Review Committee Approval Date: April 17, 2012

PROGRAM REVIEW
ASTRONOMY/PHYSICS

1. Support of the College Mission

A. Purpose of the Program

1. AST 101, AST 105, and AST 110 offer instruction in college-level astronomy, with emphasis on the observational, mathematical, and historical development of the science.
2. PHY 101, PHY 110, and PHY 220 offer instruction in college-level physics, with emphasis on the experimental, mathematical, and historical development of the science. Astronomy is naturally an excellent source for physics applications.

B. Support of the College Mission

1. Course offerings in astronomy and physics are well-suited to fulfilling the College's mission of addressing the natural desire to understand the world and the heavens.

C. Unique Institutional Goal

1. The six courses are applicable to the associate degrees offered by Palo Verde College. They are transferable and applicable to IGETC.
2. All of the offerings in astronomy and physics are transferable to California State University and the University of California. In this way, these courses assist students seeking to pursue four-year degrees in Science. The program also provides access to astronomical events.

2. Accomplishments in Achieving Previous Goals

A. Progress

1. Projected Goal: At present, there are not sufficient funds to fulfill the project of building an observatory north of the College. The number of physics courses offered should be increased. The physics laboratory should be equipped, at least to a minimum.

B. Accomplishment of Goals

2. Accomplishment of Goal: In 2004, the College offered only one astronomy course, AST 101. Now three courses are offered: AST 101, AST 105, and AST 110.
3. Accomplishment of Goal: Following the recommendation of the administration of the College, Dr. Garcia in 2004 contacted the Astronomy Club to reinitiate its activities. The club had been inactive for many years. The club now is called PVC's Colorado River Astronomy Club.

3. Population Served

A. Describe Populations

1. Students seeking transferable courses, associate degrees, or both.

B. Other Populations

2. Students enrolling in astronomy or physics courses for personal enrichment.

4. Curriculum History

A. Courses in the Program

1. AST 101 Introductory Astronomy
2. AST 105 The Solar System
3. AST 110 Beyond the Solar System
4. PHY 101 Introduction to Physics
5. PHY 110 General Physics 1
6. PHY 220 General Physics 2

B. History

The three Astronomy courses have been repeatedly and successfully offered for more than three years. It is believed that the courses will continue to be successfully offered since there has been a strong demand for them. As for Physics, only Physics 101 has been offered three times in the same period of time.

5. Course Scheduling and Availability

A. How scheduling Optimizes Availability: For Astronomy, the courses have been offered face to face during the evening, and/or distance learning to accommodate the demand. For Physics, the courses have been offered sporadically.

B. How Scheduling Optimizes Student Learning: It is convenient to offer astronomy courses in the late afternoon or in the evening so that part of the time could be used to observe the stars in the dark.

6. Student Learning Outcomes

A. Process: The course outlines of record for all astronomy courses have been regularly updated by Division faculty members. Course outlines incorporate student learning outcomes. The following plan is being implemented.

The course syllabus is updated continuously with revisions and improvements to make learning more effective. Before introducing a topic, a pre-test is administered to determine prior knowledge. The pre-test can be written or verbal. After analyzing the needs of the students from the pre-test, direct instructions are provided along with frequent checking for understanding as the instruction proceeds. Checking for understanding may be oral, written, or a demonstration. To accomplish this, the following teaching strategies are implemented: students summarize for the class the salient points of the direct instruction; students come to the board to teach a problem to the class; or students work in cooperative groups to solve problems. As errors are

detected that are common to the group, Help Guides are developed. One of the most effective methods of developing Help Guides is to have the students participate in the development of the guides, which increases class participation and ownership of the strategies in the Help Guides. After direct instruction and checking for understanding, the students then will do practical exercises in implementing what they have learned, often working in groups to solve problems or do experiments. Assignments are provided in which students research different topics and report out on them. Students participate in science experiments on the topic of discussion. For the astronomy and physics classes, students are invited to all of the events of the Colorado River Astronomy Club. Post-tests are conducted following instruction, results are reviewed with the students, and then these results are evaluated to determine if the areas where students needed help have been addressed.

B. Improvements: Many of the strategies are already being implemented. Other elements of learning assessment will be implemented in the future, as data is compiled and documentation is modified. The use of technology will be increased to provide even more simulations and observations. Based on outcomes from future assessments, improvements will be made in student learning outcomes.

7. Program and Course Coverage

A. Course Coverage by Full- and Part-time Faculty: For Astronomy, the astronomy program has had an instructor for the past ten years. There is adequate coverage based on enrollment of the program. Therefore, one or two astronomy courses have been offered each semester. For Physics, only Physics 101 has been offered sporadically.

B. Plans to improve coverage: So far, the astronomy courses offered by the Division have successfully covered the increasing demand.

C. Physics should be offered consistent with demand.

8. Professional Development

A. The instructor teaching the College's astronomy and physics courses is a full-time mathematics, physics, and astronomy instructor, and maintains current best practices of teaching theory and observational astronomy. Whenever possible, the instructor travels to different observatories, museums and astronomical places of interest in California and nearby states. As an adviser of the PVC's Colorado River Astronomy Club, he helps organize at least two major astronomical observational public events and several informal events in Blythe yearly.

9. Student Performance and Completion

A. The Registrar Office provided the following information:

COURSE COMPLETIONS FOR AST 101			
TERM	Number of Students Enrolled	Number of Students with Final Grade C or Better	Percentage of Success
Fall 2010	47	31	66
Fall 2011	33	19	58

COURSE COMPLETIONS FOR AST 105			
TERM	Number of Students Enrolled	Number of Students with Final Grade C or Better	Percentage of Success
Fall 2008	42	34	81
Spring 2009	48	40	83
Fall 2009	24	22	92
Spring 2010	32	23	72
Spring 2011	29	23	79
Spring 2012	35	Pending	Pending

COURSE COMPLETIONS FOR AST 110			
TERM	Number of Students Enrolled	Number of Students with Final Grade C or Better	Percentage of Success
Spring 2012	15	Pending	Pending

COURSE COMPLETIONS FOR PHY 101			
TERM	Number of Students Enrolled	Number of Students with Final Grade C or Better	Percentage of Success
Fall 2008	8	5	63
Fall			

2009	11	8	73
Fall 2010	14	11	79

B. Degree Completions: Currently there is no associate degree with major or emphasis in astronomy or physics. However, many students apply AST 101, AST 105, and AST 110, PHY 101, PHY 110, PHY 220 toward the associate degree in science offered by the College.

10. Enrollment and Financial Trends

A. Enrollment: The total numbers in the past four years are

TERM	TOTAL ENROLLMENTS IN AST/PHY
Fall 2008	50
Spring 2009	48
Fall 2009	35
Spring 2010	32
Fall 2010	61
Spring 2011	29
Fall 2011	33
Spring 2012	50

This means that the average number of astronomy and physics students for those eight semesters has been 42. However, the enrollment in the fall of 2011 was 33, and in the spring of 2012 it increased to 50, a real improvement.

B. Expenditures: In the past three years, the College has not incurred any expenditure for physics classes, astronomy classes or astronomy events. The Astronomy Club has supplied capital and equipment for the astronomy events.

11. Facilities

A. Adequacy of Current Facilities: For the present, the facilities are adequate.

B. Adequacy of Dedicated Space: Adequate for the present.

C. Adequacy of equipment: Adequate for the present.

D. Plans for future changes: The past administration has commented about the possibility of constructing an observatory; however, the fiscal situation prohibits this plan. Exhibits can be set up in the Library and projections can be shown in the Auditorium. The Colorado River Astronomy Club may do presentations.

12. Strengths and Weaknesses

A. Strengths: The faculty and the administration of PVC and the community of Blythe have shown interest in astronomy courses and astronomy events. The enrollment in astronomy courses and the attendance for astronomy events has increased in the past three years. The Colorado River Astronomy Club has promoted the name of the college and attracted new students. The Club presents a three-day Star Stare event in the fall, which attracts astronomers from many other areas and provides a community night which is always well attended. It also hosts an event for International Astronomy Day in the spring, which takes place at the local Palo Verde Valley Public Library. Art contests are held to promote participation in the International Astronomy Day by students in the elementary and secondary schools. Observations are also held informally throughout the year to view different astronomical events, such as the Messier Marathon.

B. Weaknesses: The lack of a dedicated facility. There is only one astronomy and physics instructor at PVC. This limits the possibilities to offer new courses.

13. Plans to Remedy Weaknesses

Plans for addressing weaknesses of the astronomy program will be the construction of a dedicated facility and perhaps events will be held at the Performing Arts Theater. More displays promoting astronomy and physics will be presented in the library.

14. Plans to Advance the Program

More astronomy and physics courses will be implemented in the near future. The astronomy courses and the astronomy events will be coordinated. The existing buildings and facilities will be used to promote interest in astronomy and physics.

PALO VERDE COLLEGE
BLYTHE, CA
PROGRAM REVIEW
BIOLOGY
2011-2012

By

Dr. Solomon Toyin Osayande

EXECUTIVE SUMMARY

Biology

1. Program Strengths:

- a. Faculty commitment to tracking and improving student learning through pre- and post-tests and through implementation of a rubric.
- b. The Biology program and faculty provides important curriculum support the PVC's nursing program.
- c. Faculty involvement in professional associations and professional development programs.
- d. Faculty development of online course in Biology to provide students with innovative teaching approaches.

2. Program Weaknesses:

Program faculty has indicated the need for tutoring services available to biology students.

3. Recommendations for Program Improvement:

Continue ongoing efforts to monitor and evaluate student learning and implement changes that continue to enhance student learning.

4. Committee Determination:

Report is accepted and may proceed to the next step in the process.

Program Review Committee Approval Date: April 17, 2012

Program Review Biology 2011-2012

Part 1: Support of the College Mission

State the purpose of the program.

The Biology Program is designed to provide varied science courses that help address the educational needs of the community. Biology courses are currently used as core and elective requirements for an Associate in Science Degree and General Education respectively. A large number of our courses meet the course requirements transferable to a Bachelor Degree at a 4 year institution.

Describe how the program supports the overall mission of the college as adopted by the Board of Trustees.

The Biology Program provided an exemplary learning environment through teaching, use of the scientific methods to solve problems, proficient use of laboratory techniques, analysis and critical thinking skills and hands-on experiences. Additionally, the goal of the Biology Program supports the college mission by providing courses that include the general education requirements needed for transfer purposes and meet the requirements for the Licensed Vocational Nursing, the Registered Nursing Programs and the Bachelor of Science in Nursing respectively.

Describe the unique institutional goal the program achieves.

The Biology Program provides general education transferable courses and specific courses designed solely toward the completion of the Licensed Vocational Nurse (LVN), the Registered Nurse (RN) and the Bachelor of Science in Nursing (BSN) Programs. Based on the aforementioned, the Biology Program provides opportunity for students to fulfill community dire need for well-trained professional healthcare workers. It satisfies the mission of the college by assisting all prospective students in developing the ability to utilize the scientific method of inquiry to find and comprehend information relating to biological issues and similarly apply that knowledge to their “real lives,” including the recognition of ethical aspects of knowledge.

Part 2: Accomplishments in Achieving Goals Outlined in the Previous Program Review

Describe progress in achieving goals outlined in the previous program review, providing evidence documenting such achievements.

The Biology Program successfully accomplished the prior goal outlined in the previous program review of preparing the prospective students for employment. Case in point, 15 former Palo Verde College students upon successful completion of the LVN, RN, BSN and Dental Hygiene Programs are gainfully employed at Palo Verde Hospital, La Paz Regional Hospital in Parker, Arizona, Eisenhower Medical Center, in Rancho Mirage, Ironwood State Prison and Chuckwalla Valley State Prison in Blythe, California respectively.

Explain modifications of goals outlined in the previous program review, providing evidence documenting such modifications.

There were no modifications of goals outlined in the previous program review.

Part 3: Populations Served

Describe the populations served by the program, including special populations.

The populations served by Biology Program include:

- Persons interested in the Licensed Vocational Nursing program
- Persons interested in a Registered Nursing program
- Persons interested in a Bachelor of Science in Nursing program
- Individuals needing continuing educational courses to maintain licenses and certificates
- Students are pursuing the Associate of Science Degree
- Prospective students who are interested in transferring to institutions of higher learning
- Biology Program makes every effort to appeal to a diverse population of students through scheduling arrangements that meet the needs of students including: graduating high school seniors, single parents, disabled, minority, and economically disadvantaged.

Describe other populations that should be served by the program, and describe plans to serve them in the future.

It is our position that courses will continue to be developed to meet the dire need and aspirations of our community.

Part 4: Curriculum History

List the courses constituting the program.

The courses constituting the Biology Program encompass:

- BIO 100 Introduction to Biology
- BIO 101 Introduction to Biology Laboratory
- BIO 110 Basics of Biology
- BIO 111 Basic Microbiology
- BIO 115 Evolution
- BIO 140 Animal Biology (Zoology)
- BIO 141 Introductory Botany (BOT 140)
- BIO 210 Human Anatomy
- BIO 211 Human Physiology
- BIO 280 Selected Topics in Biology
- BIO 290 Selected Studies in Biology

List those courses that have not been successfully offered at least once during the preceding 6 semesters.

- BIO 115 Evolution
- BIO 140 Animal Biology (Zoology)
- BIO 141 Introductory Botany (BOT 140)
- BIO 280 Selected Topics in Biology
- BIO 290 Selected Studies in Biology

Explain why such courses were not successfully offered.

The aforementioned courses were not successfully offered because of student preference for other courses that constitute the Biology Program. Additionally, when offered, courses with poor enrollment are usually cancelled by the Office of Instruction.

Provide a strategy for improving their success, or explain why they should not be removed from the program.

The Biology Program will continue the broad offering of courses and schedules to serve all students. We will schedule effective mix of day, evening and night courses across the Biology curricula.

Part 5: Course Scheduling and Availability

Describe how effectively the scheduling process of classes in the program:

Optimize class availability for day students, evening students and distance education students.

The Biology Program courses offering are student centered. We offer a wide range of courses to our prospective students. We schedule a mix of day and evening courses and many sections across the Biology curricula in order to optimize classes each semester and summer session for day students, evening students and distance education students respectively. The great success in number of students enrolling in Biological courses is an attestation to the aforementioned.

Optimizes Student Learning

Many factors help contribute to student optimize learning in the Biology Program. The quality of instruction is highly imperative. Additionally, the course content, student preparedness, adequate workload, and support services for students enable students to demonstrate problem-solving abilities in the major content areas of biology, analyze the logic of a multiple choice question and similarly choose the correct response from among related items and write clear responses to essay questions without including extraneous information or omitting information necessary to provide a clear answer.

Part 6: Student Learning Outcomes

Describe the process by which the program identifies measures and evaluates student learning outcomes at the course, program and degree levels and provide evidence that this process is being followed.

The Division of Mathematics and Sciences at Palo Verde College attest that understanding of mathematics and sciences is imperative and an integral part of well-rounded education. Towards this clear-cut goal, the Division recently instituted the Student Learning Outcomes (SLO) for all courses that demonstrate research, analytical reasoning, applied science and technological skills for real life expectations.

The Biology Program utilizes the pre-and-post test in addition to the traditional examinations testing procedures in our assessment of Program's relationship to outcome. Commencing spring 2007 Semester, the pre-tests and post-tests were given to face to face in-class students. Similarly, a rubric has been developed for scoring each question. The pre-test and post tests are duly administered at the beginning of the semester and end of the semesters. These tests are designed to ascertain the here and now of students learning.

Describe the process by which program improvements are made, and provide evidence that this process is being followed.

The pre-tests examinations will be given at the beginning of each semester and post-test will be given at the end and student's grades will be compared and evaluated. The assessment findings will yield wealth of information and most importantly, which program remediation is needed.

Part 7: Program and Course Coverage

Describe how effectively courses in the program are covered by Full-Time and Part-Time Faculty.

The Biology Program has a full-time professor and an adjunct professor at the Palo Verde College Main Campus and an adjunct faculty member at the Needles Campus. The aforementioned effectively cover all courses by a mix of day, evening, and night classes while using face-to-face, correspondence and online modes of instruction.

Part 8: Professional Development

Describe specific professional development activities in which faculty members in the program participate, and explain how such activities benefit or enhance the program and support and facilitate student learning outcomes.

The Biology Program faculty members are involved in professional development activities by attending conferences such as the Hispanic Association for Colleges and Universities, The National Science Foundation and the American Association for the Advancement of Science respectively. Additionally, the faculty members of the Biology Program duly participate in Palo Verde College Flex Day, College seminars, and career Day activities. The knowledge gained in the aforementioned is duly transmitted to prospective students in the Biology Program, thereby enhancing their know-how.

Describe areas of unmet professional development needs among faculty in the program, if applicable, and outline plans to address those needs.

Currently, there are no areas of unmet professional development needs.

Part 9: Student Performance and Completion

Display and comment on semester-by-semester course completions in the program over the preceding 6 semesters.

Academic Year	Total Student Enrollment	Successful Completion	Number Withdrawing	Retention Rate
Spring 2007	114	88	26	77%
Fall 2007	145	116	29	80%
Spring 2008	126	87	39	69%
Fall 2008	97	73	24	75%
Spring 2009	144	117	27	81%
Fall 2009	137	106	31	77%
Spring 2010	123	97	26	78%
Fall 2010	112	83	29	74%
Spring 2011	149	119	30	79%
			Total Average	76.66%

Based on extrapolation of the above table, the Biology Program continues to contribute immensely to the overall Palo Verde College mission of exemplary learning environment that promotes student success. It is imperative to bear in mind that the average retention rate for the aforementioned years is 77%.

Part 10: Enrollment and Financial Trends

Display and comment on semester-by-semester enrollments in the program over the preceding 6 semesters.

Academic Year	Enrollment
Spring 2007	114
Fall 2007	145
Spring 2008	126
Fall 2008	97
Spring 2009	144
Fall 2009	137
Spring 2010	123
Fall 2010	112
Spring 2011	149

Based on the Grade Distribution by Institutional Division, the only conclusive inference drawn is that enrollment over the past 6 semesters plus in the Biology Program shows an upward trend. This trend is attributed to several sections of Distance Education Courses being offered, several sections offered as in Human Anatomy and Human Physiology and students' dire needs.

Display and comment on semester-by-semester expenses incurred by the program over the preceding 6 semesters, as to: supplies, contracts, capital outlay and other non-salary expenses.

2006-2007	Salaries	Benefits	Supplies	Contracts	Total
Biology	\$98,020.76	\$22,604.68	\$945.31	\$1,039.00	\$122,609.75

2007-2008	Salaries	Benefits	Supplies	Contracts	Total
Biology	\$152,814.45	\$40,165.88	\$1,972.39	\$2,092.53	\$297,045.25

2008-2009	Salaries	Benefits	Supplies	Contracts	Total
Biology	\$163,924.20	\$44,693.47	\$932.47	\$2,831.20	\$212,381.34

2009-2010	Salaries	Benefits	Supplies	Contracts	Total
Biology	\$113,728.20	\$33,384.21	\$1,332.07	\$116.00	\$148,560.48

2010-2011	Salaries	Benefits	Supplies	Contracts	Total
Biology	\$102,089.50	\$22,846.40	\$0.00	\$0.00	\$124,935.90

Expenses incurred by the Biology Program over the preceding 6 semesters plus are appropriate for current enrollment. In terms of specificity, the aforementioned encompass field trips, mileage, and conferences.

Part 11: Facilities and Equipment

Are current facilities, such as classrooms, offices and equipment, adequate to support the program? Explain.

There is one dedicated lecture/laboratory classroom for the Biology Program. Adjoining the lecture/laboratory classroom is the faculty office. The proximity of the aforementioned allows for great access between the lecture/laboratory and the faculty office. Additionally, there are extensive specimen storage areas adjacent to the classroom.

Is available dedicated space adequate to support the program? Explain.

The available dedicated space is adequate to support the Biology Program at this time.

Is available equipment adequate to support the program? Explain.

Yes, the available equipment is adequate to support the program in terms of here and now.

Part 12: Strengths and Weaknesses

List and comment on the major strengths of the program.

The Biology Program strengths encompass:

- Broad appeal of all our courses to prospective students in terms of high number of courses offered every semester and number of sections
- The Biology Program is financially viable based on high FTE count and strong student enrollment
- The Biology Program continue to maintain very steady student enrollment
- The unconditional positive regards for students(acceptance of students for who they are and respect for them)
- Faculty academic preparedness(academic qualifications) and years of experience

List and comment on the major weaknesses of the program.

- Lack of qualified tutors in the Learning Skills Center to tutor biology students in dire need
- Insufficient coverage of online courses and face to face classes.

Part 13: Plans to Remedy Weaknesses

Identify specific steps to correct identified weaknesses and provide the timeline by which they are to be corrected.

To ensure availability of qualified tutors to teach students in the Biology Program, the Learning Skills Center is duly informed to hire students who have successfully completed higher core courses within the discipline. Hiring additional adjunct professors of Biological Sciences will be a step in the right direction in the near future.

Part 14: Plans to Advance the Program.

Describe Other Plans That Will Advance the Program

The Biology Program is dedicated to providing an exemplary learning environment that promotes students success. Toward this clear cut objective, we will continue to monitor students in Biology Courses success rate through assessment of student's skills that include: term papers, laboratory reports, student centered discussions, data analysis, problem solving ability and critical thinking skills. Biological Sciences continue to be the basic building blocks, cornerstones and integral part of the Palo Verde College Curricula. Additionally, an online introduction biology course will be taught every semester.

PALO VERDE COLLEGE

Program Review

Chemistry

Prepared by Biju Raman

2007-2012



The Chemistry Department at Palo Verde College believes that an understanding of chemical sciences is an indispensable part of a sound education in the overall development of students in not only the Health and Allied Sciences, but also engineering, pure and applied sciences. The goal is to provide all students with access to supportive, excellent education, where all students learn by direct experience with the methods and processes of inquiry. Our faculty are highly trained, committed to student development, and dedicated to helping students achieve their maximum potential. Our curriculum is structured to encourage students to engage in critical thinking and to help students realize that learning is a life-long endeavor.

EXECUTIVE SUMMARY

Chemistry

1. Program Strengths

- a. Faculty utilization of innovative teaching methodologies, such as open resource textbooks and online lab s, to enhance student learning.
- b. Implementation of math and English pre-requisites to increase the chances of student success.
- c. Faculty commitment to continuously evaluate student learning through the use of multiple measures of learning.

2. Program Weaknesses

- a. Need for qualified tutors in Chemistry.
- b. Need for sufficient enrollments to justify more frequent face-to-face chemistry lab sections.

3. Recommendations for Program Improvement:

Continue work in open education resources, monitoring student learning achievement, evaluating learning, and making improvements in teaching methods and approaches.

4. Committee Determination:

Report is accepted and may proceed to the next step in the process.

Program Review Committee Approval Date: April 17, 2012

PROGRAM REVIEW: CHEMISTRY 2007-2012

PART I: SUPPORT OF THE COLLEGE MISSION

A. STATE THE PURPOSE OF THIS PROGRAM.

The Chemistry discipline is comprehensive in that it provides a variety of science courses that address the diverse educational needs of the community. Almost all course offered by the Discipline satisfy general education requirements for associate degrees and transfer to four-year institutions. These courses emphasize the development of student critical thinking skills that contribute to academic and vocational success and impart a basic understanding of the sciences.

B. DESCRIBE HOW THE PROGRAM SUPPORTS THE OVERALL MISSION OF THE COLLEGE AS ADOPTED BY THE BOARD OF TRUSTEES.

The Chemistry discipline provides an excellent learning environment through both face-face and online courses, all designed to give students the tools for success through on the job, practical, hands-on experiences. This discipline promotes scientific inquiry, environmental awareness, synthesis of interrelated disciplines, and lifelong learning through lecture and laboratory courses for those pursuing degrees within and outside of the physical sciences.

C. DESCRIBE THE UNIQUE INSTITUTIONAL GOAL THE PROGRAM SERVES.

The Chemistry discipline provides unique lower division general education transferable and nontransferable courses, as well as preparation for occupational certificate programs. No other discipline at Palo Verde College encompasses and teaches such a wide variety of topics. Upon completion of this coursework, students should be able to use scientific methodologies to understand, describe, explain, and even predict human behavior and natural phenomenon. By knowing how people and social institutions function and relate to their physical surroundings, students can contribute to society.

PART II: ACCOMPLISHMENTS IN ACHIEVING GOALS OUTLINED IN THE PREVIOUS PROGRAM REVIEW

A. DESCRIBE PROGRESS IN ACHIEVING GOALS OUTLINED IN THE PREVIOUS PROGRAM REVIEW, PROVIDING EVIDENCE DOCUMENTING SUCH ACHIEVEMENTS.

By moving the medium of instruction for the CHE 101 – Introduction to General Chemistry to exclusively online medium on the BRIDGE using OER (open educational

resources), we have reached all the underserved populations of the district by making the course material available 24/7 for the duration of the semester. This is also done at a fraction of the earlier cost since the OER materials are free. By incorporating both the theory and lab experience into a unique virtual experience, we have eliminated the lack of attendance issue which is plaguing many of our face-face classroom experiences.

B. EXPLAIN MODIFICATIONS OF GOALS OUTLINED IN THE PREVIOUS PROGRAM REVIEW, PROVIDING EVIDENCE DOCUMENTING SUCH MODIFICATIONS.

By working with the curriculum committee the department has strengthened the prerequisites required for both entry into the course in terms of the English and math courses. This has strengthened the fundamental basis of reading, writing and arithmetic that is required to succeed in the class.

PART III: POPULATIONS SERVED

A. DESCRIBE THE POPULATION SERVED BY THE PROGRAM, INCLUDING SPECIAL POPULATIONS.

The Chemistry program is open to all Palo Verde College Students and the general public interested in physical sciences. The students served by the Chemistry discipline are diverse with slightly more females (52%) than males (For the academic years of 2004 through 2011). Student ethnic diversity is also mixed, with no single ethnicity forming a majority. This is unusual, as historically under-represented people are less likely to take science courses. Thus this discipline is showing improvement in breaking down the ethnic barriers of education.

The Chemistry discipline serves approximately 20 students per semester. The course offering in the Discipline are currently meeting the needs of transfer students. Initial surveys indicate that almost all of the students enrolled in Chemistry courses indicated transfer as an educational goal.

B. DESCRIBE OTHER POPULATIONS THAT SHOULD BE SERVED BY THE PROGRAM, AND DESCRIBE PLANS TO SERVE THEM IN THE FUTURE.

PVC sometimes has enough students to offer a face-face class. So our labs are kept ready and viable to keep these offerings possible in the future.

PART IV: CURRICULUM HISTORY

A. LIST THE COURSES OFFERED SUPPORTING THE PROGRAM OR CERTIFICATE. GIVE THE DATE OF FIRST OFFERING FOR EACH, AND INDICATE HOW MANY SECTIONS WERE SUCCESSFULLY OFFERED DURING EACH OF THE LAST FOUR REGULAR SEMESTERS (TWO YEARS).

Term	COURSE	SUCCESSFULLY OFFERED
Fall 2009	CHE 101: Introduction to General Chemistry	1 Section
Term	COURSE	SUCCESSFULLY OFFERED
Spring 2010	CHE 101: Introduction to General Chemistry	1 Section
Term	COURSE	SUCCESSFULLY OFFERED
Fall 2010	CHE 101: Introduction to General Chemistry	1 Section
Term	COURSE	SUCCESSFULLY OFFERED
Spring 2011	CHE 101: Introduction to General Chemistry	1 Section

B. LIST THOSE COURSES THAT HAVE NOT BEEN SUCCESSFULLY OFFERED AT LEAST ONCE DURING THE PRECEDING SIX (6) SEMESTERS.

- CHE 108: Organic Chemistry
- CHE 109: General, Organic and Bio-Chemistry
- CHE 210: General Chemistry I
- CHE 211: General Chemistry II

C. EXPLAIN WHY SUCH COURSES WERE NOT SUCCESSFULLY OFFERED.

Currently, courses are undergoing revision to include the ability to deliver them via online methods. It is the desire of the program to have these courses offered in the very near future. Therefore, they have not been placed on “inactive status” in the college catalog.

D. PROVIDE A STRATEGY FOR IMPROVING THEIR SUCCESS, OR EXPLAIN WHY THEY SHOULD NOT BE REMOVED FROM THE PROGRAM.

Again, the ability to deliver these courses via online delivery method should and will make these courses strong and viable offerings for student success.

PART V: COURSE SCHEDULING AND AVAILABILITY

A. OPTIMIZES CLASS AVAILABILITY FOR DAY STUDENTS, EVENING STUDENTS AND DISTANCE EDUCATION STUDENTS.

The majority of the Discipline's courses transfer to CSU and UC campuses. Since the Chemistry Department, offers the courses online, it meets the needs of students on campus either during the day or evening, and also those who are located off campus.

Since the CHE 101 – Introduction to General Chemistry is offered completely online, we are able to meet the needs of the students who need this class by making it available continuously on the BRIDGE. Once the students have registered through the PVC-Services, the same login credentials can be used to access the content on the BRIDGE. The OER that are used in the program, currently like MIT – OPENCOURSEWARE and FLATWORLDKNOWLEDGE.COM make their resources available with a very high degree of reliability.

An important factor in offering courses that students need is the decision about when and where they are offered. Studies show that the number of hours students work per week is increasing. In most cases students are working between 15 and 25 hours/week, with 25% working more than 26 hours/week. Clearly, when students work this much, the scheduling of classes will be critical in determining if they can, in fact, take any classes. Palo Verde College instructors report a continuing pattern of large numbers of students attempting to add distance education classes at the beginning of the terms in an attempt to alleviate the restrictions of work schedules not coinciding with course offerings. The courses taught in the Discipline are difficult to learn via traditional distance education methods. Therefore we have developed, and will continue to develop, courses that can be taught on-line in an attempt to make the learning of scientific processes and methods mirror that of face-to-face instruction.

B. OPTIMIZES STUDENT LEARNING.

Quality of student learning may be reflected by student grades, student retention and student satisfaction. Student learning will be evaluated using retention rates (% of students that remain in the class until the end of the term), successful completion rates (% of students that receive A, B, or C grades in the class) and Survey data, beginning with the Fall 2002 term. The retention rate for Discipline courses is 58% and is an indication of our student's belief they can complete the course. This is especially remarkable given the nature of the Discipline's courses and their diversity. The transfer courses for science majors and non-science majors are rigorous and demand a commitment of time and energy from our students. The successful completion rates for the Discipline need to be improved, and towards this goal, some of the attributes of the student success have been identified. Over the last six semesters, 44% of the students have completed Discipline courses successfully. Many factors can contribute to a student's ability to successfully complete a course. Quality of instruction, preparedness of students, course content, support services for specific courses and student workload are a few of the factors that affect student success.

PART VI: STUDENT LEARNING OUTCOMES

A. DESCRIBE THE PROCESS BY WHICH THE PROGRAM IDENTIFIES, MEASURES AND EVALUATES STUDENT LEARNING OUTCOMES AT THE COURSE, PROGRAM AND DEGREE LEVELS, AND PROVIDE EVIDENCE THAT THIS PROCESS IS BEING FOLLOWED.

The Division of Mathematics and Sciences at Palo Verde College believes that an understanding of mathematics and the sciences is an indispensable part of a sound education. Our goal is to provide all students with access to supportive, excellent education, where all students learn by direct experience with the methods and processes of inquiry. Our faculty are highly trained, committed to student development, and dedicated to helping students achieve their maximum potential. Our curriculum is structured to encourage students to engage in critical thinking and to help students realize that learning is a life-long endeavor.

The Chemistry discipline strives to maintain the currency of course content and laboratory exercises (where applicable). All course outlines have been reviewed and updated within the last two years. Each course outline defines course-specific learning outcomes. However, on a program-wide basis, the Math and Science Division has recently developed Student Learning Outcomes (SLO) applicable for all courses taught with the spectrum of Math and Science and has implemented assessment procedures and analysis of the SLOs.

- *Demonstrate research, analytical reasoning, applied science and technological skills for real life expectations.*

Pre and Post tests are continually being administered in face-to-face classes as stated in the most recent program review. Traditional tests, quizzes, and homework are being assigned and graded with appropriate corrections and comments.

The quality of lab reports that were being submitted by the CHE 101 – Introduction to General Chemistry students after viewing the video labs online was inadequate. To help them better model the report, a sample of a good report is being provided in the course syllabus along with suggested topic headings to help structure the written presentation.

The Chemistry Discipline have utilized pre- and post-tests, progressive quizzes, and rubrics since Spring 2007 term as an instrument for assessing learning outcomes. With the recent addition of our online learning system, this task has been simplified, both in terms of delivery and analysis. The tests/quizzes are designed to involve students solving specific problems using several sets of particular data relevant to the Discipline. A rubric has been developed for scoring the various attributes of the project.

All assessment findings for the division will be compiled and cataloged giving each faculty the ability to evaluate outcomes at the course and division level. Following the

time necessary for sufficient data collection, the Math and Science Division will compile the assessment findings and make the necessary recommendations for remediation, if necessary.

B. DESCRIBE THE PROCESS BY WHICH THE PROGRAM IMPROVEMENTS ARE MADE, AND PROVIDE EVIDENCE THAT THIS PROCESS IS BEING FOLLOWED.

Learning assessment is in its proficiency stages at Palo Verde College. The access to DATATEL, necessary for compiling the necessary reports and thus furthering the program can be improved. The Chemistry Department will work closely to provide the students with any necessary program improvements as identified.

PART VII: PROGRAM AND COURSE COVERAGE

A. DESCRIBE HOW EFFECTIVELY COURSES IN THE PROGRAM ARE COVERED BY FULL-TIME AND PART-TIME FACULTY.

The Chemistry faculty meets the minimum qualifications to be an instructor at Palo Verde College and is adequate to support the program at the Main Campus, as well as all distance education courses.

B. DESCRIBE ONGOING OR PROJECTED DEFICIENCIES IN FACULTY COVERAGE OF COURSES IN THE PROGRAM.

There is no need for additional support staff for the Chemistry program at this time. However, due to the nature and expertise necessary, it will be likely that an adjunct faculty member will be utilized to cover the course taught at Needles Campus.

PART VIII: PROFESSIONAL DEVELOPMENT

A. DESCRIBE SPECIFIC PROFESSIONAL DEVELOPMENT ACTIVITIES IN WHICH FACULTY MEMBERS IN THE PROGRAM PARTICIPATE, AND EXPLAIN HOW SUCH ACTIVITIES BENEFIT OR ENHANCE THE PROGRAM AND SUPPORT AND FACILITATE STUDENT LEARNING.

The Chemistry faculty is involved in campus activities and is active in the community and professional organizations, continuing their education and participating in activities that utilize or increase their expertise. Instructors routinely participate in professional development in terms of continuing professional education and seminars. Instructors attend professional workshops available through the various discipline-related organizations and federal, state and regional organizations. Faculty also enrolls in university courses to keep current in their field. Faculty of the Chemistry program regularly participate in in-service activities, including College Flex Day trainings, college seminars, and other professional growth opportunities offered on campus. Currently,

there is much interest in open educational resources and service learning. The faculty is heavily involved in providing students access to free educational materials to lessen the financial burden students face, and has placed many students in seasonal, temporary or career oriented places of employment.

The chemistry department is part of the Kaleidoscope Project which is in the running to obtain the Gates Foundation Scholarship to further the development of use of OER's to improve student accessibility and success to the Chemistry courses.

B. DESCRIBE AREAS OF UNMET PROFESSIONAL DEVELOPMENT NEEDS AMONG FACULTY IN THE PROGRAM.

At this time, all professional development is currently being met, thus there are no plans to address the needs to rectify any deficiency.

PART IX: STUDENT PERFORMANCE AND COMPLETION.

A. DISPLAY AND COMMENT ON SEMESTER-BY-SEMESTER COURSE COMPLETIONS IN THE PROGRAM OVER THE PRECEDING SIX (6) SEMESTERS.

Academic Year	Success Rate	Retention Rate
Fall 2008	10%	20%
Spring 2009	70%	90%
Fall 2009	21%	28%
Spring 2010	22%	55%
Fall 2010	70%	80%
Spring 2011	70%	75%

The retention rate for chemistry discipline courses over the last six semesters is 58% and is an indication of our student's belief they can complete the course. This is especially remarkable given the nature of the Discipline's courses and their diversity. The successful completion rates for the Discipline are respectable. Over the last six semesters, 44% of the students have completed Discipline courses successfully.

PART X: ENROLLMENT AND FINANCIAL TRENDS.

A. DISPLAY AND COMMENT ON SEMESTER-BY-SEMESTER ENROLLMENT IN THE PROGRAM OVER THE PRECEDING SIX (6) SEMESTERS.

Semester	Student Enrollment
Fall 2008	14
Spring 2009	9
Fall 2009	21
Spring 2010	13
Fall 2010	21
Spring 2011	16

Enrollment over the past six semesters has shown a familiar trend when a campus is in the development phase of a discipline program. Historically, enrollment numbers are

predictably varied during the phase in period of a program. Recent enrollment has decreased and is constant with the overall college unduplicated headcounts for the last six semesters

B. DISPLAY AND COMMENT ON SEMESTER-BY-SEMESTER EXPENSES INCURRED BY THE PROGRAM OVER THE PRECEDING SIX (6) SEMESTERS.

Academic Year	Supplies	Operating Exp.	Capital	Total	Change
2006-2007	0	0	0	0	
2007-2008	0	0	0	0	0
2008-2009	0	0	0	0	0
2009-2010	0	0	0	0	0
2010-2011	0	0	0	0	0
Average	0	0	0	0	0

The expenses incurred by the Chemistry discipline are appropriate for current enrollment and program activities. For the past years, the chemistry department has kept the expenses to zero in all categories of supplies, operating expenses and capital because we switched to a virtual format there is no expense of the resupply of the chemicals towards the wet lab experience. Also, by switching over to the OER's and making the resources on the BRIDGE from these sources, we have kept the cost of development to a minimum.

PART XI: FACILITIES AND EQUIPMENT

A. ARE CURRENT FACILITIES, SUCH AS CLASSROOMS, OFFICES AND EQUIPMENT, ADEQUATE TO SUPPORT THE PROGRAM?

The Chemistry discipline is housed within the Classroom Building and has a dedicated lecture/laboratory classroom. The facilities utilized by the Discipline were constructed within the last eleven years and are in excellent condition. Adjoining the dedicated classroom is the faculty office, allowing for ease of and simultaneous access to the teaching forum and faculty office.

B. IS AVAILABLE DEDICATED SPACE ADEQUATE TO SUPPORT THE PROGRAM?

All of the facilities are adequate for the support of this program.

C. IS AVAILABLE EQUIPMENT ADEQUATE TO SUPPORT THE PROGRAM?

Both the classroom and faculty office have a dedicated computer station each. In addition, the classroom has media playing devices and a digital projection and sound system. Laboratory equipment is limited, but adequate to support the program.

D. DESCRIBE PLANS FOR FUTURE CHANGES IN SUPPORT FACILITIES OR EQUIPMENT.

If we make CHE 109 an online hybrid class by making the theory online and labs face-face, we will need to replenish our stock of the chemistry experiments that make up that class. Apart from the restocking of the chemicals needed for specific courses, there is no major need for capital outlay in the support facilities or equipment.

PART XII: STRENGTHS AND WEAKNESSES

A. LIST AND COMMENT ON THE MAJOR STRENGTHS OF THE PROGRAM.

- The Chemistry Discipline provides our students with a wide variety of courses designed to meet their varied needs and requirements.
- Our primary goal is to facilitate student growth and success and at the same time maintain academic standards appropriate to our courses.
- Continue to coordinate course offerings with changes in requirements of the various CSU and UC campuses, as well as, the changing vocational needs of students.
- Chemistry faculty brings years of education, practical work experience, and training to every class.
- Chemistry maintains a steady student enrollment in classes.
- The ability to provide adequate online laboratory instruction.

B. LIST AND COMMENT ON THE MAJOR WEAKNESSES OF THE PROGRAM.

- Lack of qualified tutoring services that have the knowledge base to tutor students in the Chemistry. A consistent question received from students is directed at where they can obtain help outside of the classroom. Currently there are no tutors in the Learning Skills Center qualified to tutor chemistry students. As a result, the faculty assumes the role of tutor, allowing students in need to receive extra learning opportunities.
- The course content delivery currently depends on the ready availability of the OER's which are third party resources for maintaining the structure and integrity of the program. If these were for any reason to be not made available then we would have to develop our proprietary resources on the BRIDGE so that the department would be self-sufficient.

PART XIII: PLANS TO REMEDY WEAKNESSES.

IDENTIFY SPECIFIC STEPS TO CORRECT IDENTIFIED WEAKNESSES AND PROVIDE THE TIMELINE BY WHICH THEY ARE TO BE CORRECTED.

In order to have a qualified tutor that is able to tutor students in Chemistry, that student must have already successfully completed core courses within the Chemistry discipline. An incentive of monetary compensation (employment) might improve the chances that a former Chemistry student would consider occupying such a position. Currently there are no monies dedicated that would allow this to occur; however, recent budget requests are being considered.

PART XIV: PLANS TO ADVANCE THE PROGRAM.

DESCRIBE OTHER PLANS THAT WILL ADVANCE THE PROGRAM.

The Chemistry Discipline is committed to providing our students with the best possible education. To that end we need to continue to establish procedures for evaluating our successes and failures and employ them on a regular basis. We need to monitor all of our courses' retention and success rates and develop plans to address any problem areas that are identified. We need to develop the use of different teaching methods that reach across a broad spectrum of student intellectualism. We need to continue to develop evaluation methods that monitor the effectiveness of our teaching techniques.

Over the next couple of semesters, the chemistry faculty will be working at identifying alternate OER's and also developing proprietary resources on the BRIDGE.

PALO VERDE COLLEGE

Program Review

Math

Prepared by Biju Raman, Sandra Sher, Paul Shibalovich

2007 - 2012



To support the students in their attempts to learn analytical skills, perseverance, and detail so that they might be better prepared for the job market

EXECUTIVE SUMMARY

Math

1. Program Strengths:

- a. Faculty willingness to attempt innovative teaching methodologies and techniques, such as online instruction and implementation of the Hawkes Learning System.
- b. Faculty willingness to implement new technologies in teaching including the Starboard and ITV transmission to the Needles Center.
- c. Faculty demonstrated commitment to professional development through conferences and seminars.
- d. Courses in basic skills courses offered in small time segments on a daily basis to enhance student participation and learning.

2. Program Weaknesses:

Faculty states the need for more usage of open resource materials to reduce the burden of costs to the students.

3. Recommendations for Program Improvement:

- a. Research the availability of open resource textbooks and materials in math, particularly basic skills math, and evaluate the feasibility of implanting such materials.
- b. Continue efforts in program and course learning assessment.
- c. Using research-based approaches continue investigating innovations in scheduling and technology.

4. Committee Determination:

Report is accepted and may proceed to the next step in the process.

Program Review Committee Approval Date: April 17, 2012

PART I: SUPPORT OF THE COLLEGE MISSION

A. STATE THE PURPOSE OF THE PROGRAM.

To support the students in their attempts to learn analytical skills, perseverance, and detail so that they might be better prepared for the job market. Mat 106 and higher level math courses transfer to most (all) 4 year institutions. ASSIST.org has articulated these math courses for certain majors. Some TMCs and parts of our Associate of Arts require certain math courses above number 100.

B. DESCRIBE HOW THE PROGRAM SUPPORTS THE OVERALL MISSION OF THE COLLEGE AS ADOPTED BY THE BOARD OF TRUSTEES.

Math skills help the students develop their abilities to think and work together with others as they develop the thought process. This tends to promote student success, lifelong learning, and community development.

C. DESCRIBE THE UNIQUE INSTITUTIONAL GOAL THE PROGRAM ACHIEVES.

We teach mathematics to many students who are at risk educationally. Many are not well prepared for the college environment, with parents who haven't experienced higher education as a way to economic success. Two unique aspects of our program are the Hawkes Learning and the Bridge. These have helped the math department to reach more of these students. Hawkes is a computerized math learning system in which students do homework, quizzes, practice problems online. The computer software will let you pass a section provided a certain percentage is obtained. Without the appropriate minimum percentage, it will give you more problems and help until you do reach the appropriate minimum percentage.

PART II: ACCOMPLISHMENTS IN ACHIEVING GOALS OUTLINED IN THE PREVIOUS PROGRAM REVIEW.

A. DESCRIBE PROGRESS IN ACHIEVING GOALS OUTLINED IN THE PREVIOUS PROGRAM REVIEW, PROVIDING EVIDENCE DOCUMENTING SUCH ACHIEVEMENTS.

Course outlines are presently being updated - especially to reflect online courses, hybrid courses, ITV courses, and Correspondence Education courses. Most of these changes started in Fall 2010. Technology (ITV, internet, Starboard, polycomm, etc.) and Hawkes learning software is causing changes in mathematics instruction. This is being done in order to have better educated math students.

B. EXPLAIN MODIFICATIONS OF GOALS OUTLINED IN THE PREVIOUS PROGRAM REVIEW, PROVIDING EVIDENCE DOCUMENTING SUCH MODIFICATIONS.

When the Hawkes Learning Program is set to a high level, the program forces students to increase their level of competency and comprehension. This then relates to higher homework grades. Since Hawkes can be done at any computer then, if attendance is low, the students can work off campus at their own PC. The Hawkes tutorial is on our website. The Bridge and online courses also enable students to work off campus. Pre/Post tests are still being administered. The "attendance" hurdle is thus weakened.

PART III: POPULATIONS SERVED.

A. DESCRIBE POPULATIONS SERVED BY THE PROGRAM, INCLUDING SPECIAL POPULATIONS.

Online service is being extended to anyone who has internet and to Needles students through the Polycom and the Starboard. This is in addition to on-campus students.

B. DESCRIBE OTHER POPULATIONS THAT SHOULD BE SERVED BY THE PROGRAM, AND DESCRIBE PLANS TO SERVE THEM IN THE FUTURE.

More online courses will bring more students. The Polycom (ITV) will bring in more Needles students without having to hire more math instructors. Hybrid courses will bring in students who need combinations of the various modes of instruction.

PART IV: CURRICULUM HISTORY.

A. LIST THE COURSES CONSTITUTING THE PROGRAM. OF THE COURSES CONSTITUTING THE PROGRAM, LIST THOSE COURSES THAT HAVE NOT BEEN SUCCESSFULLY OFFERED AT LEAST ONCE DURING THE PRECEDING SIX (6) SEMESTERS. EXPLAIN WHY SUCH COURSES WERE NOT SUCCESSFULLY OFFERED.

COURSES:

Mat 80 Basic Arithmetic Skills

Mat 81 Fundamentals of Arithmetic (Pre-Algebra)-Correspondence Education

Mat 82 Fundamentals of Arithmetic with Lab (Pre-Algebra)

Mat 83 Elementary Algebra –Correspondence Education

Mat 84 Elementary Algebra with Lab (also online)

Mat 86 Intermediate Algebra – Correspondence Education

Mat 88 Intermediate Algebra with Lab (also online)

*Mat 100 Math for Prospective Elementary School Teachers

*Mat 103 Math for Elementary Teachers I

*Mat 104 Math for Elementary Teachers II

Mat 106 Statistics

*Mat 108 Liberal Arts Math - inactive as of November 2011 due to low enrollment. (It was offered during spring 2011 as an independent study but had only 2 students.)

Mat 110 College Algebra

Mat 210 Pre-Calculus

Mat 220 Calculus I

Mat 224 Calculus II (not offered because of low enrollment)

Mat 226 Calculus III (not offered because of low enrollment)

*Mat 280 and Mat 290 Selected topics in Mathematics (not offered during the past 6 semesters due to no enrollment)

(*means inactive as of Nov. 2011)

B. PROVIDE A STRATEGY FOR IMPROVING THEIR SUCCESS, OR EXPLAIN WHY THEY SHOULD NOT BE REMOVED FROM THE PROGRAM.

Counselors could have sign-up sheets for the non-offered courses in advance in order to determine if these courses can be offered. Online versions of these courses should be constructed. Mat 84 and Mat 88 are presently online with Mat 110 forthcoming. The math department plans to start offering courses online and then evaluate the courses which have good enrollments. The upper level courses should not be put on “inactive” status since they are needed for careers such as medicine, engineering, computer science, and science.

PART V: COURSE SCHEDULING AND AVAILABILITY.

A. DESCRIBE HOW EFFECTIVE THE SCHEDULING PROCESS OF CLASSES IS IN THE PROGRAM: OPTIMIZES CLASS AVAILABILITY FOR DAY STUDENTS, EVENING STUDENTS, AND CORRESPONDENCE EDUCATION STUDENTS.

We offer classes Monday through Thursday –day and evening. Most classes meet in the same time slots thus offering ease of transferring a student from one course to another, if needed. The math department also works with the learning communities in order to help students enroll in more classes by not conflicting courses from Math, English, and Reading.

B. OPTIMIZES STUDENT LEARNING.

ITV courses allow Needles students to join classes in Blythe, thus increasing enrollment without hiring more instructors. Mat 84 and Mat 88 are also offered online as well as face-to-face.. A greater volume of students can learn at once.

PART VI: STUDENT LEARNING OUTCOMES.

A. DESCRIBE THE PROCESS BY WHICH THE PROGRAM IDENTIFIES, MEASURES, AND EVALUATES STUDENT LEARNING OUTCOMES AT THE COURSE, PROGRAM AND DEGREE LEVELS, AND PROVIDE EVIDENCE THAT THIS PROCESS IS BEING FOLLOWED.

Pre and Post tests are still continually being administered in face-to-face classes as stated in the most recent program review. Traditional tests, quizzes, and homework are being assigned and graded with appropriate corrections and comments.

B. DESCRIBE THE PROCESS BY WHICH PROGRAM IMPROVEMENTS ARE MADE, AND PROVIDE EVIDENCE THAT THIS PROCESS IS BEING FOLLOWED.

When post tests are given at the end of each semester the results are compared to those of the pre-tests. Adjustments to the course are then studied and altered in order to help students succeed. The Hawkes Learning System aides in this process automatically through the computer. Our small math department continually converses about better ideas for our classes.

PART VII: PROGRAM AND COURSE COVERAGE

A. DESCRIBE HOW EFFECTIVELY COURSES IN THE PROGRAM ARE COVERED BY FULL-TIME FACULTY AND PART-TIME (ADJUNCT) FACULTY.

At present, Mathematics Department has two full-time math instructors (Sandra Sher and Paul Shibalovich), two full-time instructors who teach mathematics and another subject (Alejandro Garcia and Biju Raman), and four part-time instructors. Math faculties are capable to cover all math courses offered to the students. We seem to have enough part-time instructors at this time. Mathematics department offers courses in face-to-face, ITV, online, and correspondence formats. All full-time instructors have been trained to use ITV equipment and are capable to offer courses in face-to-face, ITV, and correspondence formats. Some full-time teach online courses. Part-time faculty teaches correspondence or face-to-face courses.

B. DESCRIBE ONGOING OR PROJECTED DEFICIENCIES IN FACULTY COVERAGE OF COURSES IN THE PROGRAM.

With current full-time and part-time faculty, the Mathematics department does not have deficiency in course coverage at this time.

C. DESCRIBE PLANS TO IMPROVE PROGRAM AND COURSE COVERAGE, IF APPLICABLE.

The Mathematics department is still going through the adoption phase of Hawkes Learning System (HLS). The full-time math faculty completed their training. However, part-time faculty still needs to complete HLS training to be able to utilize the capabilities of the platform.

Currently, Mathematics department offers two math courses online: MAT084 (Introductory Algebra) and MAT088 (Intermediate Algebra). We have plans to expand our online course offerings in the future. Fall semester 2012, we plan to introduce new MAT110 (College Algebra) course online. According to other community colleges in California, MAT084 (Introductory Algebra) is the lowest math course that can be offered to college students, because it is difficult to build crucial math foundation using online format. Mathematics department has a potential to offer math courses beyond MAT110 (College Algebra). However, it needs to be worked out with counselors to ensure sufficient enrollment.

PART VIII: FACULTY PROFESSIONAL DEVELOPMENT

A. DESCRIBE SPECIFIC PROFESSIONAL DEVELOPMENT ACTIVITIES IN WHICH FACULTY MEMBERS IN THE PROGRAM PARTICIPATE, AND EXPLAIN HOW SUCH ACTIVITIES BENEFIT OR ENHANCE THE PROGRAM AND SUPPORT AND FACILITATE STUDENT LEARNING OUTCOMES.

Faculty members of the Mathematics Department are active in professional development by attending conferences, workshops, and by sharing their own expertise with one another. Math faculty members who attended conferences/workshops share information with the rest of the faculty members to facilitate student learning outcomes.

During the past few years, Biju Raman, Sandra Sher, and Paul Shibalovich attended several

conferences & workshops on student learning and teaching methodology. These include the following:

Conference/Workshop Data

Conference/Workshop	Topic	When
PVC Services Workshop	Colleague Interface	August 2008
HLS Workshop	Basics of HLS	May 2010
IT Workshop	How To Use the Bridge	September 2010
Aleks Webinar	Developmental Math	October 2010
HLS Workshop	Quizzes & Exams with HLS	December 2010
AMATYC	Math Study Skills	Fall 2011
Basic Skills Initiative Institute	Compressed Calendar	Fall 2011

In May and December of 2010, full-time math faculty attended HLS workshops to learn how to use Hawkes Learning System platform. This provided math faculty additional tools to enhance teaching methodology as well as to improve student learning outcomes. With the implementation of HLS, full-time faculty has more tools to evaluate student performance and provide more options to the DSPS students. In particular, HLS is capable to either narrate lecture to the student or allow the student to watch lecture in video format with closed caption, thus ensuring that DSPS students are not missing anything from the lecture.

The Bridge workshop helped math faculty to better serve local students as well as those that access course materials via the Internet. The Bridge platform allow the faculty to post course syllabi, worksheet, study guides, etc.

PVC Services workshop was another successful milestone in the math department. Starting from the Fall semester 2008, math faculty started to use the Colleague (PVC Services Interface) to enter midterm grades and final grades. Also, the Colleague allows the faculty to find out location of the student, which is very useful for Correspondence courses.

After attending Basic Skills Leadership Institute, math department offered remedial math courses in compressed format during Fall semester 2011. The findings showed that compressed format produces lower success rates. Therefore, the department discontinued offering the math courses in the compressed format.

B. DESCRIBE AREAS OF UNMET PROFESSIONAL DEVELOPMENT NEEDS AMONG FACULTY IN THE PROGRAM, IF APPLICABLE, AND OUTLINE PLANS TO ADDRESS THOSE NEEDS.

The math faculty members conduct self and peer evaluations in order to help determine weak and strong elements of his/her teaching methodology and then subsequently review them in order to insure providing quality instruction of Mathematics at Palo Verde College. With the adoption of Smartboards and implementation of HLS, faculty needs more training to utilize all capabilities of the technology. In particular, faculty needs to learn how to use HLS quiz module for pre-tests and HLS Report module. This will allow the faculty to identify strengths and weaknesses of the students at the early stage, and subsequently, it will help the instructors to craft best possible

instructional delivery.

PART IX: STUDENT PERFORMANCE AND COMPLETION

A. DISPLAY AND COMMENT ON SEMESTER-BY-SEMESTER COURSE COMPLETION IN THE PROGRAM OVER THE PRECEDING SIX (6) SEMESTERS. (COURSE COMPLETION RATE = A, B, C, D, OR CR DIVIDED BY A, B, C, D, F, CR, NC, W, MW, IP).

Math faculty members at Palo Verde College closely watch student performance in Mathematics in order to facilitate in the delivery of math instruction. The average completion rate in math courses over the past five years was 76.3%. Table below breaks down the completion rates of math courses, for face-to-face, correspondence, online, and ITV courses by semesters.

Academic Year	Completion Rate
Fall 2008	78.3%
Spring 2009	77.0%
Fall 2009	81.6%
Spring 2010	73.9%
Fall 2010	75.6%
Spring 2011	71.2%
Average	76.3%

The average completion rate for Palo Verde College students for 2001-2006 was 80.5%. We noticed that recent completion rate average of our students dropped 4.2% when compared with the same during previous years. We identified two reasons that contributed to the decline of the student completion rate. The first reason was introduction of new technology in our classrooms. During the past five years we adopted the Bridge and HLS. Mathematics Department believes that the lack of student preparation in using technology caused the completion rate to drop. We think that the second factor is associated with reduced hours for tutoring services offered to our students.

B. DISPLAY AND COMMENT ON SEMESTER-BY-SEMESTER DEGREE OR CERTIFICATE COMPLETION, IF APPLICABLE.

Not applicable--there is no Mathematics certificate or a degree.

PART X: ENROLLMENT AND FINANCIAL TRENDS

A. DISPLAY AND COMMENT ON ANNUAL ENROLLMENT IN THE PROGRAM OVER THE PRECEDING SIX (6) SEMESTERS.

For the past three years, enrollment of math students at PVC has grown the average of 1.5% per year. The Math Department is doing its best to meet the growing demand of enrollment at PVC. Being a small college remotely located in the desert, we are able to attract more students to study mathematics by offering ITV & hybrid courses in addition to face-to-face & correspondence

courses. Table below reflects growth of student enrollment for the past three years (headcount of students at the end of semester).

Enrollment Data

Semester	Student Enrollment	Year/Year Change
Fall 2008	517	
Spring 2009	447	
Fall 2009	479	-7.4%
Spring 2010	429	-4.0%
Fall 2010	521	8.8%
Spring 2011	466	8.6%
Average		1.5%

Even though past several years were difficult for Palo Verde College financially, math department was able to maintain positive student enrollment growth. Statistics stated in the table above suggests that currently, there is no need to hire another full-time math instructor.

B. DISPLAY AND COMMENT ON ANNUAL EXPENSES INCURRED BY THE PROGRAM OVER THE PRECEDING SIX (6) SEMESTERS, AS TO: SUPPLIES, CONTRACTS, CAPITAL OUTLAY, AND OTHER NON-SALARY EXPENSES.

Table below shows expenses data of the mathematics department in the past five years stated by category in dollar amounts. The last column shows percent change calculated on year over year basis (current year/prior year). The table does not show the salaries and benefits expenses.

Expenses Data

Academic Year	Supplies	Operating Exp.	Capital	Total	Change
2006-2007	2,891	865	0	3,756	
2007-2008	2,986	396	0	3,382	-10.0%
2008-2009	2,260	0	0	2,260	-33.2%
2009-2010	1,356	0	0	1,356	-40.0%
2010-2011	0	0	0	0	-100%
Average	---	---	---	---	-45.8%

In the past five years, expenses in the mathematics department at PVC have declined at the average rate of 45.8 per year, to the point that faculty didn't spend any money for supplies, operating expense, or capital outlay during 2010-2011 academic year. Yet in the past three years, math faculty were able to maintain average growth of student enrollment at 1.5% per year. We were able to do this for the short run. However, it is difficult to provide services with no money for supplies and operational expenses.

PART XI: FACILITIES AND EQUIPMENT

A. ARE CURRENT FACILITIES, SUCH AS CLASSROOMS, OFFICES AND EQUIPMENT, ADEQUATE TO SUPPORT THE PROGRAM? EXPLAIN.

At present we are well supported with the computer labs availability, Hawkes Learning System software on all campus computers, dedicated server for the computer software authentication on campus, polycomm connectivity with the Needles Center classrooms, STAR boards for electronic classroom. While the computer labs in the classroom are adequate for today's needs, in the future we need to provide funds for replacing or upgrading the personal computers.

B. IS AVAILABLE DEDICATED SPACE ADEQUATE TO SUPPORT THE PROGRAM? EXPLAIN.

With the projected year on year growth of 1.5%, the classroom/lab availability is adequate to support the program at present.

C. IS AVAILABLE EQUIPMENT ADEQUATE TO SUPPORT THE PROGRAM? EXPLAIN.

As explained in part A., funds need to be provided for the replacement/upgrading of the PC and the maintenance of the Polycomms and other equipment needed for ITV classes in Needles center.

D. DESCRIBE PLANS FOR FUTURE CHANGES IN SUPPORT FACILITIES OR EQUIPMENT.

While the Math department unanimously adopted the Hawkes Learning System Software for all of our MAT classes, we are continuously reevaluating the Student Learning Outcomes against the effectiveness of the computer adaptive math teaching software.

PART XII: STRENGTHS AND WEAKNESSES

A. LIST AND COMMENT ON THE MAJOR STRENGTHS OF THE PROGRAM.

Math department is constantly evaluating our learning materials against the Student learning Outcomes, we revise our course outlines to keep them current and adapt our teaching techniques to incorporate the latest technology and tools that are available on the market.

B. LIST AND COMMENT ON THE MAJOR WEAKNESSES OF THE PROGRAM.

While we are using a lot of proprietary software, like the Hawkes Learning System, we are not using sufficient OER (open educational resources) like Khan Academy, MIT open courseware and other resources to incorporate into our teaching pedagogy. This will not only reduce the cost burden to the students since these are free and constantly updated, it will enable us to market the program across the country with a unique perspective.

Currently, we have only two remedial/basic skills courses which are online: MAT 084 – Elementary Algebra and MAT 086 – Intermediate Algebra. More courses can be developed to be taught online, and one, MAT 110 – College Algebra, is in the process of being prepared to be presented to the Curriculum Committee.

PART XIII: PLANS TO REMEDY WEAKNESSES

A. IDENTIFY SPECIFIC STEPS TO CORRECT IDENTIFIED WEAKNESSES AND PROVIDE THE TIMELINE BY WHICH THEY ARE TO BE CORRECTED.

Currently we are completing the 3rd year of a 5 year Title III grant that is enabling us to go towards a virtually connected campus. We have to make full use of these opportunities to identify and establish good OER so that a completely online MATH program becomes not only viable but also competitive because of the low cost to the students.

PART XIV: PLANS TO ADVANCE THE PROGRAM

DESCRIBE OTHER PLANS THAT WILL ADVANCE THE PROGRAM.

Currently Math Instructors, especially those teaching the Basic Skills classes, enjoy in-class tutoring and other services which need to be supported by the District on an ongoing basis.

Additionally, smaller classes benefit the students in these remedial classes, and students enjoy a level of support and interaction with the instructor which is critical to the student's success.

The Math department continues to encourage the scheduling of the face –to- face basic skills classes, namely, MAT 080 – Basic Arithmetic and MAT 082 – Arithmetic Fundamentals with lab, on a daily basis throughout the week, so that the students can benefit from the same topic being discussed at the same time of the day and the constant engagement reinforces the student learning outcomes.

Sign-up sheets for classes which do not form part of the two year plan will be placed with the counselors, so that when sufficient numbers are available, these courses can be offered.

Hawkes Learning System training for adjuncts will be scheduled, during the Spring 2012 semester so that there is training available for the uniform implementation of Hawkes among adjunct and full time faculty at Palo Verde College.

The Math Department will continue to offer the lowest levels of Math like MAT 080 – Basic Arithmetic and MAT 082 – Arithmetic Fundamentals with Lab in small time segments meeting on a daily basis to reinforce the Student Learning Outcomes in those classes.