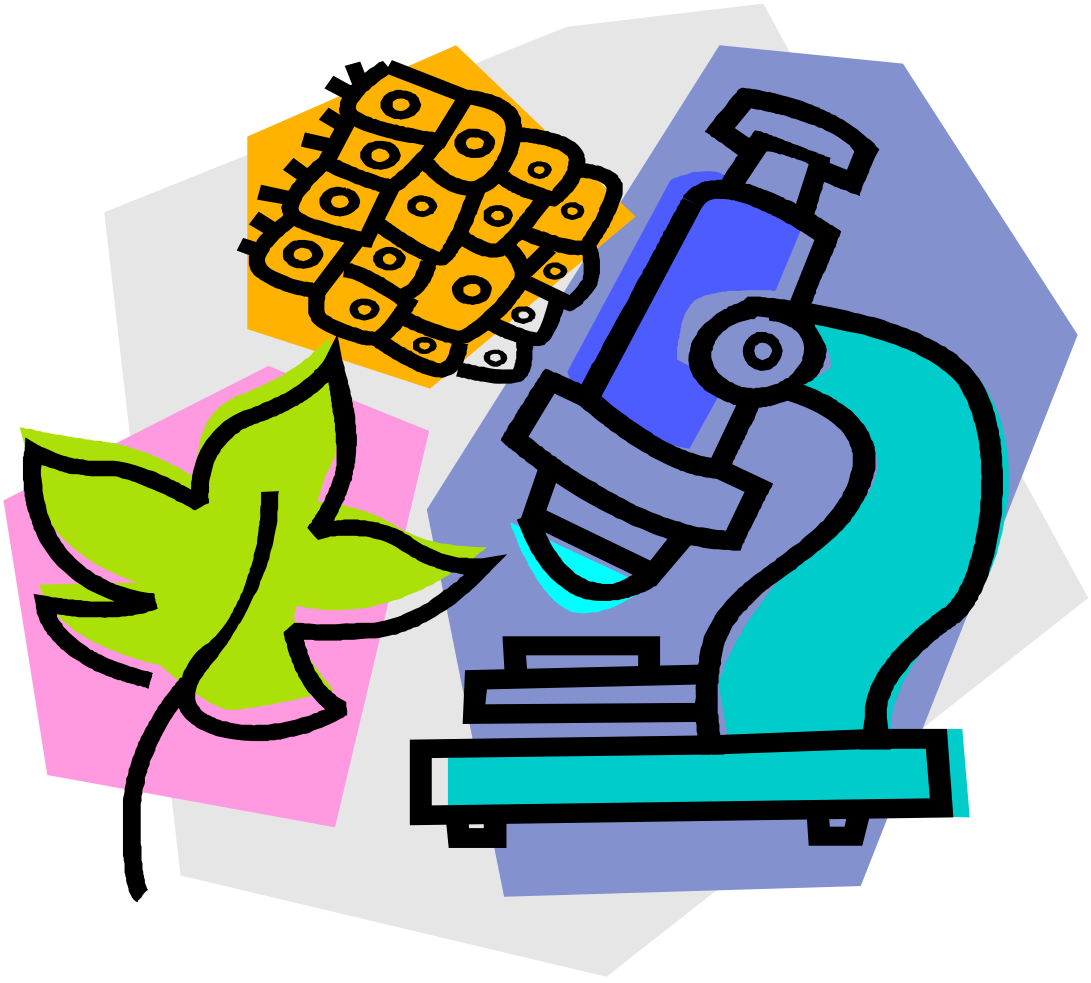
Phoenix College
Biology Department

Annual Report
2008-2009



Mark Rosati, Department Chair

The Phoenix College Biology Department has had an interesting year of changing enrollment patterns, new curriculum advancements and facility improvements. Our faculty continue to be active in the advancement of curriculum to increase relevancy, currency, and student retention and success. We have added more online courses and increased the use of multi-media equipment in the classroom and laboratory. Our partnerships are advancing to include a faculty as an Advisory Board member for the Arizona STEM Center at Science Foundation Arizona, along with existing teacher training and new dual enrollment partner at Maryvale High School.

Our greatest challenge has been many years of understaffing in the face of continuous growth and demand for biology classes, and hiring processes that are not flexible and nimble enough to attract and select faculty with the greatest potential for achievement and success within our college. We have lost another faculty member to retirement at the end of this year Dr. Philip Pepe will bring his amazing career accomplishments to Australia. Last year, Dr. Philip Tate retired and we were awarded only a temporary full time position as replacement. We will again request permanent full-time positions to replace both Drs. Tate and Pepe, so that we can keep up with the high demand for biology classes at Phoenix College.

Again this year, our faculty and staff have received substantive accolades for service. Guadalupe Candanedo, Biology administrative support, has achieved two additional "Acts of Excellence" awards for outstanding service. Dr. Robin Cotter was awarded the Phoenix College Distinguished Teaching Award. It is a great pleasure for me to report on Biology Department faculty and staff outstanding achievements and high degree of motivation and dedication to our students.

Department Accomplishments

Student Success and Retention

Phoenix College Biology Department faculty strive to support the retention and success of our diverse student body in many ways. We have multiple approaches to increase student success: an emphasis on skill development, the use of alternative technologies, the development of online and hybrid courses, creation of learning communities, and discussion of individual faculty and staff work for greater student success,

Emphasis on skill development: All biology faculty employ student activities that encourage the development of skills in numeracy, analysis, data collection, writing, critical thinking, information literacy (such as the use of electronic and printed information resources), and use of science equipment. Biology student lab activities are collaborative and interactive by nature. PC biology science labs are an experiential application of science principles, engaging students individually and in groups in tasks that employ equipment, information, mathematics and analysis for skill development. All biology instructors use rubrics (evaluation matrices) to evaluate student work and for students to use for self-evaluation.

Use of alternative technologies: Biology faculty utilize the Internet in a variety of ways to enhance access and student support, including web pages and student activities. Several faculty have received grants to advance student support in the form of computer software to develop Internet-based student access to course materials outside of class time and in-class applied technologies called student responders. For greater student engagement and interaction in the learning process, biology faculty have increased the use of oral presentations for greater engagement using, student electronic responder technology (clickers), non-invasive physiology data collection in labs, and oral presentations by students, just to name a few.

The Biology Department faculty also extensively use computer-based activities in three applications: 1) faculty and student in-class use of Internet-based and electronic information database resources to broaden available physical resources; 2) Internet delivery of courses (including hybrid courses, in which the lectures are done on the Internet, and the labs are in class); and 3) student in-class application of computers and software used in the biosciences industry, such as for real science data collection.

Development of online and hybrid courses: Our Department's goal for online course delivery has been to develop an online or hybrid version of each of our course offerings. Offering online courses reaches many nontraditional students that have a difficult time attending classes because of work, parental responsibilities or disabilities. We have increased the number of fully online and hybrid courses this past year including our first offering of fully-online BIO 100 and BIO 160 for Fall 08, and BIO 181 hybrid. During this next year a hybrid version of BIO 201 and 205 will be completed by faculty.

Creation of learning communities: Biology faculty collaborate with other faculty from other departments, including Chemistry, Math, English, Reading and the Library, for the development of student skills. Faculty have been funded for and created learning communities that integrate cross-curriculum based projects and activities in critical thinking, data analysis and critical reading and math skills**.** Biology faculty that teach biology majors collaborate with chemistry faculty from a learning community for science majors, and anatomy and physiology and microbiology faculty are collaborating for allied health care majors to ensure a comprehensive and cohesive connection between competencies and skills in each separate course.

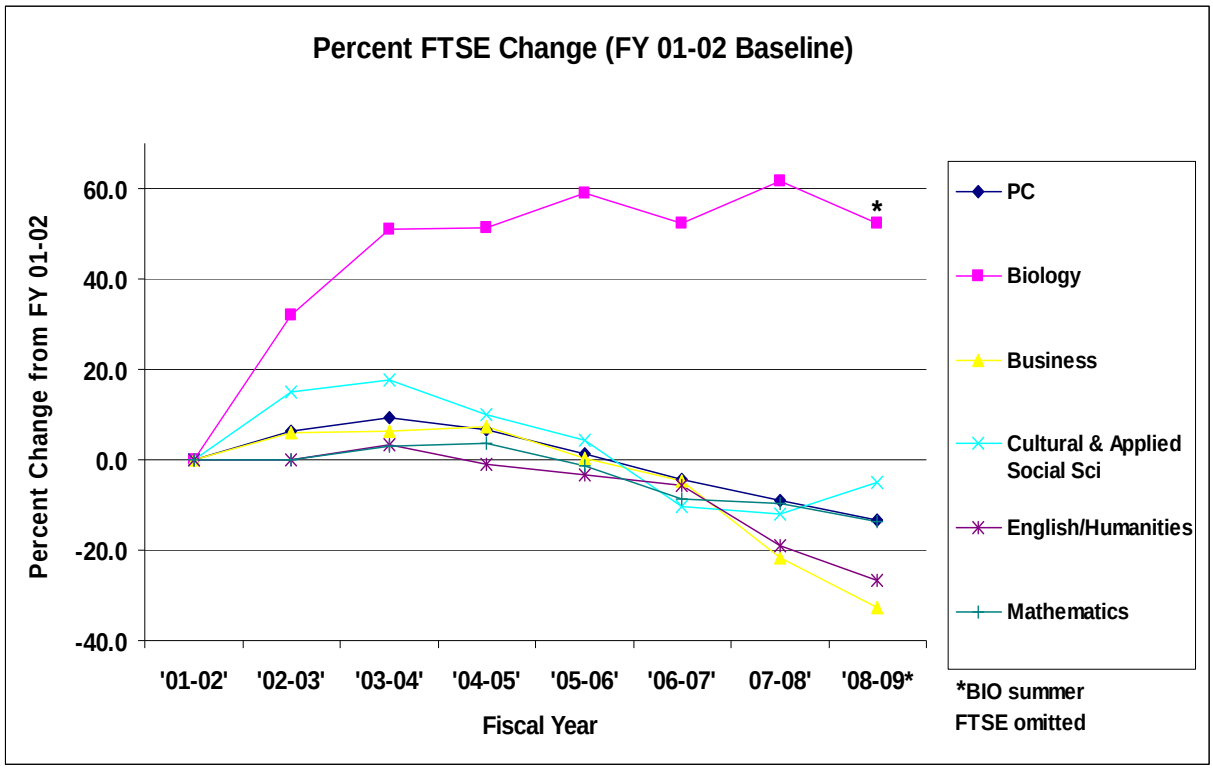
Individual meetings with faculty: As a new approach for retention and student success, many biology faculty are requiring students to have regularly scheduled individual meetings with the instructor. These meetings are used to review individual grades and performance in class and for advisement purposes. Several faculty require students to tour and meet with Learning Services staff, library resources and other student support amenities on campus to familiarize students with campus student success support facilities.

Development expansion of dual enrollment classes: We are active in addressing community needs for career pathways, high school dual enrollment and teacher training.

The high community demand for health care professionals has had a significant continuous impact on biology enrollment, especially anatomy and physiology courses, as several biology courses are pre- and co-requisites for healthcare programs in MCCCD. We had our first successful year of dual enrollment offerings at Arcadia, Maryvale and Bioscience High Schools with a total of over 21 FTSE this past year

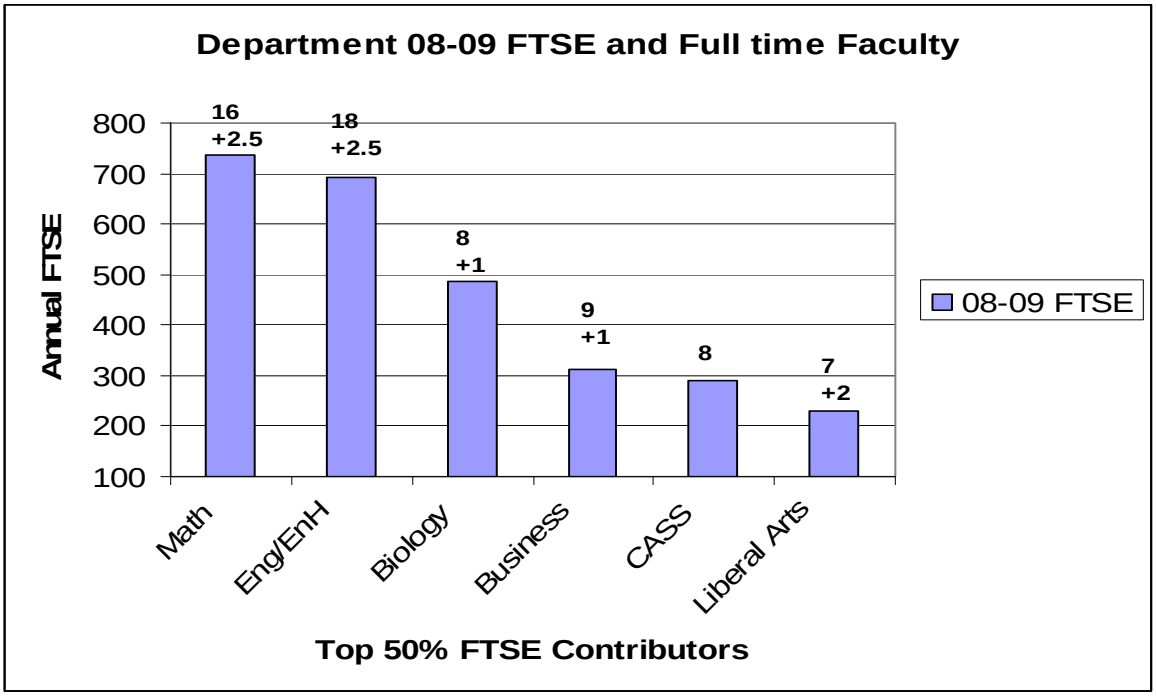
Enrollment Trends and Factors Affecting Enrollment

The Biology Department's overall enrollment has remained stable for the past three years with a small increase this year, although class registration has had substantial *trend* changes. In past years, student registration was robust during the first two months of open enrollment; we have observed a change to a pattern of slow enrollment followed by dramatic increases within the two weeks before the start of class with enrollment surging up to the first few days of class. Although our high point enrollment continues to grow, the "last minute" enrollment trend has made it difficult to effectively strategize the number of class section offering per course. In developing class schedules, our primary goal is to meet the demands of students using enrollment trends and program needs. We have instituted a change in course offerings that best ensures full time faculty load and FTSE ratio by offerings and times and days that meet the changing demands of student enrollment trends.



Biology enrollment at Phoenix College has remained the third top enrolling discipline at Phoenix College for several years, compared to a continuous decline in all other large departments and the campus as a whole. We have not experienced the

substantial enrollment growth of previous years, which we believe reflects the greater trend of decreased enrollment at Phoenix College and MCCCD colleges due to legislation and economic trends. Continuous understaffing for six years has been another significant contributor to enrollment trends. The Biology Department is the only understaffed of the top FTSE contributors on campus, whereas all other top contributors have had continuous overstaffing and declining enrollment trends for the same time period.



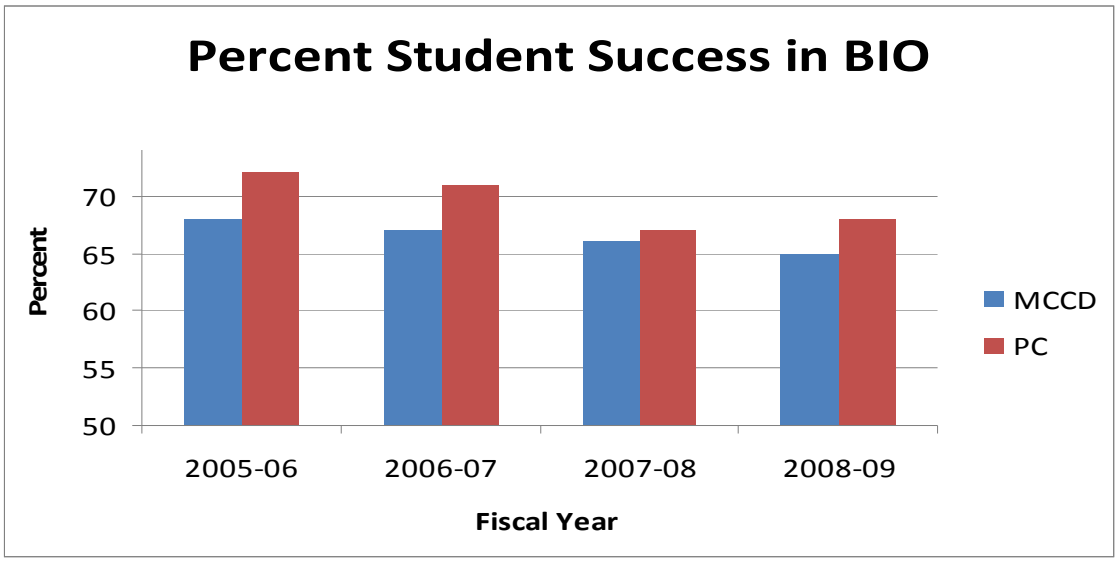
Student Learning and Teaching Effectiveness

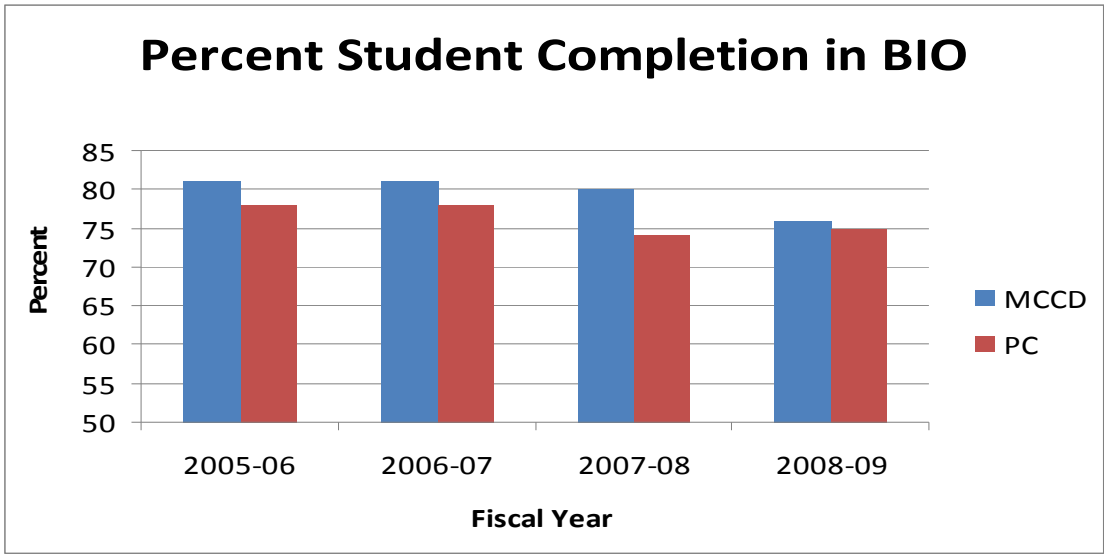
Measurement of Department and Faculty Success

The Biology Department uses several data sets to examine student learning and teaching effectiveness. We use student retention and student success data from PRIE and DSS reports to help make decisions about classroom activities and student success strategies. We also pay close attention to student evaluations of instructors. Instructors are evaluated each year by all of their class sections to allow for a robust sample from different class preps. Student elevations analyzed by PC Office of PRIE have shown that BIO courses are significantly higher than all other departments at PC.

We have remained essentially unchanged in student retention for the past two years, while all BIO in MCCCD have steadily declined over the past four years. Biology student success as defined by students with a C grade or better has increased at PC from

last year and consistently shows higher success rate than all BIO in MCCCD.





We work actively to maintain our student success rates. Our Department consistently meets with campus student advisors to discuss optimizing class schedules for students and class offerings. We also ask advisors for student feedback regarding their experiences with biology classes at Phoenix College so that we may use this form of data for quality considerations. We have used all of these sources of information to promote a higher quality experience for students while ensuring course offerings, meeting times, and alternative forms of delivery (such as the Internet) meet student needs. Students with important issues that may affect their performance and attendance in biology classes are handled as quickly as they are reported by their instructors, and when necessary by the Department Chair.

Curriculum Review, Revision and Development

Phoenix College Biology faculty are among the most active in curriculum review, revisions, and development of all biology faculty in MCCCD. The Environmental Scince multidisciplinary curriculum was created and developed by Dr. Pepe to be a lab science area that includes all of the lab science curricula. This program is currently in moratorium due to continuous Biology Department understaffing of faculty. ENV 101 continues to be a transferable lab science course for undergraduate degrees.

Our faculty are actively engaged in revising each of our course offerings to include activities that engage students in campus student assessment areas critical thinking, information literacy, numeracy (data analysis), oral presentation, reading and writing. They are working together and with faculty and staff from other areas and disciplines on campus.

Use of Alternative Delivery Technologies and Courses

The Biology Department faculty extensively use computer-based teaching and learning activities in three applications: 1) faculty and student in-class use of Internet-based and electronic information database resources to broaden available physical resources; 2) Internet delivery of courses (including hybrid courses, in which the lectures are done on the Internet, and the labs are in class); and 3) student in-class application of computers and software used in the biosciences industry, such as for real science data collection.

We also continue to develop wholly online and hybrid versions of each course offered in the classroom. We have been offering several courses fully online for the past several years including anatomy and physiology for Allied Health programs, BIO 201 and BIO 202, an introductory biology course BIO 156, and marine biology BIO 145. During this past year fully online BIO 100 and 160 filled several class offerings for each semester. We have included a complete rework of BIO 156 (introductory biology for allied health) and BIO 201. During the remainder of 2009 a hybrid version of BIO 205 (microbiology) is being developed. BIO 160 fully online our first offering of fully on line BIO 100 for Fall 08. Our enrollment in fully online courses over the past year has been over 250 students per semester including the summer. We will continue to develop hybrid and fully online versions of more courses in the coming year until all biology courses have in online versions offered.

Dual Enrollment

Our enrollment is being positively affected by our new dual enrollment agreements and online class offerings. Our first year of dual enrollments since 1998 included Arcadia High School, contributing 18.4 FTSE, Maryvale High School with 1.9 FTSE, and Bioscience with 1.6 FTSE. We are continuing to seek out interested teachers

and qualified high school science teachers to offer dual enrollment courses to their students.

Analysis and Development of Course Offerings

Course offerings and scheduling are always of primary importance to Biology Department management and operations. Successful course schedule optimizes enrollment trends in time and day offerings, courses offered, online delivery options, and substantive student support in each course offered. In developing class schedules, our primary goal is to meet the demands of students using enrollment trends and program needs. We have instituted a change in course offerings that best ensures full time faculty load and FTSE ratio by offerings and times and days that meet the changing demands of student enrollment trends.

Faculty and Staff Accomplishments and Professional Growth

Biology Department faculty and staff are very involved in activities that substantively contribute to both our students' educational needs and faculty professional growth. As each Department member contributes significantly to our mission and goals; I will include a separate narrative for each, in alphabetical order.

Mickie Bond M.S., faculty: Ms. Bond has been active and contributed in the campus Earth Day with talks on organic agriculture and a campus wide tour of Medicinal Plants of Phoenix College for the third year. Ms. Bond was nominated and awarded the PC Basics Exceed Expectations category presented by President Solley. Ms. Bond continues to be one of our most popular instructors with students. Her classes are among the first to fill completely.

Guadalupe Candanedo A.A., Administrative Secretary: Guadalupe Candanedo's dedication to the smooth, efficient and organized operations of the Biology Department continues to be of the highest quality. Ms. Candanedo does an incredible job at introducing adjuncts to the process of our Department and the campus. Her work with adjuncts produces a high quality of student experience as new adjunct employees are highly familiar with lines of communication and department organization. This past year Ms.Candanedo was presented two additional PC Basics awards including 'Exceed Expectations' and 'Agility' by college President Solley for her amazingly helpful work with PC Institutional Advancement. Ms Candanedo continues work in PC's Institutional Advancement to cover a temporary vacancy by the campus graphic designer.

In addition to her outstanding work with our department, Ms. Candanedo has been very active with the PC Green Committee substantively contributing to such activities as PC Video on Environmental Concerns and the creation of recycling bookmarks and displays for campus recycling

Robin Cotter Ph.D., faculty: During the 2008-2009 academic year Dr. Cotter was an active member of the PC Employee Development committee, co-chair of the PC

Critical Thinking Assessment Committee and SASS co-mentor for the Phoenix College Women's Soccer team.

In July, Dr. Cotter represented Phoenix College at the 28th Annual International Conference on Critical Thinking in Berkeley, California. During the fall 2008 Day of Learning, she attended the "Strengths Quest Training Workshop" moderated by Scott Geddis and in September she helped represent Phoenix College at the District Faculty Development Retreat. In collaboration with Dr. Patricia Finkenstadt from the PC Biology Department and Cyndie Carroll, the Professional Development specialist for Maricopa County, Dr. Cotter helped conduct a Professional Development workshop for biology teachers within Maricopa County. The purpose of these workshops was to teach current biology techniques to grade school and high school biology teachers in an effort to enhance their instruction in the biological sciences. In October, Dr. Cotter attended workshops on the use of Flickr Photo and SpeakerBox classroom capture software and attended the MCLI Dialogue Day entitled, "Introduction to formative Classroom Assessment" hosted by Dr. Tom Angelo. In the fall of 2008, she along with biology faculty, Dr. Patricia Finkenstadt, and nursing faculty, Matilda Chavez and Salina Gonzales, received an MCLI Teaching and Learning with Technology grant. Since being funded for this project, Dr. Cotter and several colleagues worked with Media Services to create the first in a series of ten digitally-recorded simulated patient case studies that will be utilized to help pre-nursing and nursing students develop better clinical reasoning skills. In April of 2009, they presented our work at the American Association of Community Colleges (AACC) meeting in Phoenix. In the spring of 2009, Dr. Cotter attended the PC "Day of Learning" workshop on the use of SecondLife as a virtual tool to enhance student exploration and learning. In February of 2009, she served as a co-coordinator and presenter for the annual Sexually Transmitted Disease seminar presented at Phoenix College. In May, Dr. Cotter served as co-organizer of the Phoenix College Pre-Graduation Employee Reception sponsored by the Employee Development committee. In the spring of 2009, Dr. Cotter received an eLearning grant to fund the development of an online BIO 205: Microbiology course and a Title 5 mini-grant for the development of an online "Bio BootCamp" student tutorial series. In June, she will be representing Phoenix College at the2009 Learning College Summit being held in Phoenix, Arizona. In addition to these activities, Dr. Cotter is a member of the American Society for Microbiology and serves as an At-Large representative on the PC Faculty Senate

In addition, Dr. Cotter was involved with collaborators from the University of Nebraska Medical Center in the preparation of a peer-reviewed research manuscript submitted to the Journal of Neuroscience Research entitled, "CXCL8 protects human neurons from amyloid-β (Aβ)-induced neurotoxicity: Relevance to Alzheimer's disease (AD)."

Patricia Finkenstadt Ph.D., faculty: Many of Dr. Finkenstadt's accomplishments this year were focused on improving her proficiency utilizing technology and gaining skill in innovative classroom activities. A particular goal was the creation and expansion of learning resources for traditional and online anatomy and physiology courses. In conjunction with an Adjunct Faculty, Dr. Finkenstadt developed a

series of digital practice laboratory exams. They found that these resources have increased the success of students enrolled in BIO 201. Similar materials are under development for BIO 202. Next, the first in a series of digital case studies was designed this year. Students will be presented with patient case studies via Adobe Presenter that challenge them to apply critical thinking skills in order to solve disease-related problems. These case studies will incorporate aspects of pathophysiology, infectious diseases and treatments into student-centered projects. The innovative nature of these case studies was highlighted at a presentation at the American Association of Community Colleges Annual Meeting. Furthermore, the development of these case studies was recognized by MCLI and awarded a Teaching with Technology grant. Additionally, Dr. Finkenstadt applied for a grant to promote the development of materials for underprepared students interested in STEM careers. In response to student comments, she is building a series of learning modules aimed at alleviating the deficiencies of students enrolled in the pre-Allied Health courses. These modules will be available via Blackboard and available to any student enrolled in a biology course at PC. Last, an e-learning grant will support the development of materials that can be utilized for hybrid and online courses. Attendance at several professional conferences has provided the necessary inspiration and ideas for the expansion of current face-to-face and new online courses.

Dr. Finkenstadt has become much more active in our college processes while serving as Zone 6 faculty Senator. She was an integral part of a subcommittee organized to analyze the efficiency of the committee structure at PC. The findings of this committee will be utilized by the Senate President to increase the equity of committee assignments among faculty. She also served as Senate Secretary, responsible for recording and publishing minutes and organizing elections and ballot initiatives. Dr. Finkenstadt's value to the Senate and college was recently recognized when she was elected to serve as a member of the District Faculty Executive Committee (FEC) for the 2009-2010 academic year. Dr. Finkenstadt was also recently asked to serve on the Title V Math-Science Specialist hiring committee, a reflection of my commitment to providing the highest quality service to the students at PC. She also serves as the Pre-Pharmacy Club Faculty Advisor and SASS Mentor for Womens Soccer.

This year Dr. Finkenstadt again had the opportunity participate in several Professional Development events at Phoenix College, the District and the community at-large, both as a presenter and an audience member. These include attendance at MCLI-sponsored An Introduction to Formative Classroom Assessment and a presentation at the Maricopa Teaching and Learning with Technology Conference that highlighted the utilization of 'clicker' technology in the A&P curricula at PC. She participates in the Phoenix College annual Sexually Transmitted Diseases seminar continues to provide a unique learning opportunity for students, staff, and faculty. She also completed training in Blackboard, a welcome and necessary education to begin the design of BIO 201 online. Our continuing community partnership with the Arizona Science Center culminated with a presentation at the Back to School Part Deux in November. While this presented the opportunity to offer discipline-specific content to a variety of elementary, middle and high school teachers, co-facilitating a Science Professional Development Day at Mohave Middle School allowed a more individualized and personal

discussion of the potential problems and solutions involved in teaching the biological sciences. Lastly, the establishment of Dual Enrollment in BIO 160 with Arcadia High School (SUSD) and Phoenix Bioscience High School (PUSD) significantly expanded PCs potential for recruiting highly-qualified students.

Matt Haberkorn M.S., Lab technician and adjunct faculty: Mr. Haberkorn has worked hard to create and maintain partnerships with the Phoenix Desert Botanical Garden (DBG) as a contributing researcher in plant ecology research and has co-authored several research projects with DBG researchers including his most recent co-authored presentations "Sonoran Desert Ephemeral Drainage Plant Communities" and Sonoran Desert Ephemeral Drainage Plant Communities of the White Tank Mountains, AZ presented at the Arizona Riparian Council Annual Meeting Prescott, AZ April 11, 2008. Mr. Haberkorn continues as a Native Seed Search Gardeners Network contributor to their database for Phoenix growing conditions.

In addition to Mr. Haberkorn's busy lab technician role and ongoing projects, he has been very active in professional activities including completion of his first term of Desert Botanical Garden Desert Landscaping School, guiding Peoria High School student Yan Lee and Phoenix College student Theresa Becker through extensive lab internships, presenting research at the ASU "Dynamic Desert" conference (Haberkorn, M. 2009. Geomorphology, hydrology and vegetation along Sonoran Desert ephemeral drainages. Dymanic Desert Conference: Arizona State University, School of Life Sciences. Phoenix, Arizona February 26-27), completing Hazardous Material training, leading PC Senior Preview Day biology tours, adding to several student lab activities with faculty and keeping the Department greenhouse activities coordinated and operational.

Joshua James B.S., Lab Technician: Mr. James is a highly motivated member of our staff and continues to be the 'go to' person for faculty coming up with solutions to better deliver lab content and to significantly improve lab protocols for teaching. Last year Mr. James completed four EPA's Air Pollution Training Institute (APTI) courses to better understand pollutants and their monitoring and the ways in which the EPA measures, reports, and determines standards for air quality.

In addition to Mr. James' busy lab technician role and ongoing projects, he has been very active in professional activities. For BIO 205 he explored the use of copper cast alloys to control Escherichia coli developed Cold Acid-Fast Stain and updated pictures of media and bacteria and developed a Plaque Demonstration Lab, and explored the feasibility of using Remel Lysostaphin reagent set TI no. 21130 for differentiation of Staphylococci and Micrococci for inclusion. For BIO 108, he modified Chromatography Lab for BIO108 germination and growth of many plant cuttings and seeds and assisted Mickie Bond with her Earth Day Plant Tour of PC Campus. For BIO201 and 202, he engaged in cadaver preparation.

Anna Marti-Subirana, Ph.D., faculty: Dr. Marti-Subirana has developed a successful hybrid online biology for majors that is currently being offered. In addition Dr. Marti-Subirana is developing BIO 107 (Introduction to Biotechnology) as a hybrid course

of online lectures and face to face lab activities, has been awarded an MCLI grant "Web-Based Interactive Tutorials for BIO 107 for Teacher Training.", co-awarded a Title V Mini-Grant, and supervises dual enrollment BIO 181 at Maryvale High School.

James Neuenfeldt M.S., M.Ed., M.B.A., Lab Supervisor: Mr. Neuenfeldt has and continues to contribute significantly to the safety of our teaching labs, effective and efficient use of equipment and supplies, and management and stewardship of our assets. Mr. Neuenfeldt has also been very active in professional growth activities including, completing an M.Ed. in Higher Education Leadership with distinction and an MBA from Colorado State University. Significantly, Mr. Neuenfeldt has served as MAT Executive Council President and Chairs the MAT Professional Growth Committee, MAT Tuition and Activities Committee, and the MAT Collaborative Policy Development Committee.

Mr. Neuenfeldt is also an active member of a number of substantive groups at our District Offices and campus including; the District Financial Advisory Council, District Employee Benefits Advisory Council, PC Leadership Council; MAT representative, PC MIRA Team, PC Early Retirement Committee, and PC biology faculty and Success Center staff hiring committees.

Elena Ortiz Ph.D., faculty: This academic year, Dr. Ortiz continued the partnership between Phoenix College, the City of Phoenix – Rio Salado Habitat Restoration Park, Arizona Audubon and Nick Lodato's 5th grade class at Cardinals Academy in Washington Elementary School District, started in 2005. The partnership provides PC students a service learning opportunity, collecting data for the park and for the Audubon Society and teaching the 5th graders about the environment. Dr. Ortiz is always active in professional groups and was invited to participate as a panel member for a workshop on "Careers in Ecology" at the 94th Annual Meeting of the Ecological Society of America – a professional society with over 10,000 members – in Albuquerque, NM in August 2009.

Dr. Ortiz is also continuously active in course development and improvements for student learning. She developed resource websites for all of her courses, moving all assignments, grades and lecture notes to Blackboard in an effort to go paperless, and increase student awareness of their progress in the courses. Student evaluations continue to validate Dr. Ortiz excellence in the classroom and this year was again nominated for a PC Distinguished Teaching Award.

Philip Pepe Ph.D., faculty: Dr. Pepe has consistently been the single greatest contributor to Biology Department curriculum, alternative methods of delivery and grant proposals that impact the entire department. This past year Dr. Pepe continued to facilitate campus and District level curriculum meetings to advance the Science Alliance group he created and developed collaboratively with faculty from disciplines related to the environment. Dr. Pepe has again put in an enormous amount of time and effort in this endeavor.

Dr. Pepe continued to act a co- primary investigator of the Arizona Rivers Project funded by an NSF grant, with Dr. Ortiz and in cooperation with the University of Arizona Department of Hydrology and Water Resources, to train teachers and mentors in water quality science. In addition to curriculum advancement activities and teacher training, Dr. Pepe continued create a fully-online biology classes, adding to his accomplishments with online versions of BIO 100 and BIO 156.

At the end of this year Dr. Pepe accepted employment with a Marine Station and Ecotourism business near Brisbane, Australia. He plans to retire by the end of the summer. This is an unfathomable loss for the Biology Department and Phoenix College. Dr. Pepe has had a career of unparalleled in dedication, accomplishment, and productivity at Phoenix College since 1984.

Heather Rheinfelder M.H.S., adjunct faculty: Ms. Rheinfelder has been an integral part of curriculum and student support for anatomy and physiology classes she teaches. She has developed hands-on interactive digestive system lab for 1st graders and developed hands-on interactive respiratory lab for 2nd graders at Benchmark Elementary School in Phoenix. Ms. Rheinfelder co-authored a project with the campus Math and Science Center and the Counseling Center to develop a self-paced online tutorial featuring study skills and time management strategies to improve the retention of students taking Biology 201 Anatomy and Physiology I. The first year of implementation was a success: in a comparison of lecture exam scores from the Spring 2009 semester (using tutorial) class average was 74.9%. with 7 classes from Spring 2007 to Fall 2008 (no tutorial) was 71.2%. Ms. Rheinfelder believes the tutorial support has significantly improved class exam scores for Bio 201 students and the students' subjective reports support this conclusion, as well. The tutorial can be found at: http://www.pc.maricopa.edu/ctlt/ds/study/index.php

Additionally, Ms. Rheinfelder has worked as a curriculum and course content developer with full time faculty member Dr. Finkenstadt to create, develop and implement anatomy and physiology digital practice materials for Biology 201 labs. Her students started to use these materials this semester, and they appreciated the opportunity to review lab materials from home, work, or wherever they have access to a computer.

Ms. Rheinfleder also completed a Biology 160 digitized lab manual. The new lab manual includes wet labs (blood typing, hematocrit testing, heart, brain, and eye dissections), new physiology experiments written in collaboration with GCC faculty Felicia Brenoe, and PC adjunct faculty, Amy Bell. She developed several software-assisted lab modules were added to aid in the examination of cardiac, respiratory, and digestive physiology processes, which more accurately reflect instrumentation applied in a medical setting. These new lab modules can be viewed on my website at: http://www.pc.maricopa.edu/Biology/hrheinfelder

Mark Rosati M.S., faculty, Department Chair: Mr. Rosati has continued the important role of Department Chair that includes maintaining and growing enrollment and promoting and facilitating the professional growth of faculty and staff in activities.

He has also again been very active in conducting outreach to community organizations and other educational institutions. He established two dual enrollment agreements, and added Maryvale High School as a third this year. He has established and facilitated partnerships with the Maricopa County Educational Services Agency Director Beth Hoye to develop science teacher training classes. He also established a partnership with the Arizona Science Center to offer Environmental Science 101 to teachers, in collaboration with the Arizona Science Center Education Services Manager Dianne McKee. Mr. Rosati maintains communication and an active role in creating and maintaining partnerships with the organizations listed in the Focus on Engagement and Service section of this report, including Arizona Audubon, PUHSD Bioscience High School and many others. Recently, Mr. Rosati facilitated a science teacher workshop program, where Biology Department faculty develop professional growth workshops that will be offered to teachers at their school during teacher professional growth days.

As a member of the campus Academic Department Reorganization Committee, Mr. Rosati provided all data and charts necessary to proceed with objective analyses of department FTSE and faculty structure trends.

Mr. Rosati keeps up an active teaching load for a Chair, teaching overload to support the Department during an extended period of understaffing. He was again nominted by students in Who's Who in America for education and continues to have one of the highest student evaluation rates on campus.

John Schampel, M.S.: John was an active member of PC's Critical Thinking Assessment Committee, which in Spring 2009 administered the Test of Everyday Reasoning to 400+ PC students campus-wide to gauge critical thinking skills. In Spring 2009, John collaborated with PC faculty from Biology (Robin Cotter, Patricia Finkenstadt), English (Liz O'Brien), Philosophy (Eddie Genna), and Library Instruction (Kelly Lambert) to present "STD's, HIV, and You," a campus-wide forum for PC students where participating faculty provided information and answered questions about the most common sexually-transmitted diseases during three seminars on the week of Valentine's Day. The presentations were attended by well over 400 PC students and enthusiastically received.

For professional development, John attended the Ecological Society of America's 2008 annual meeting in Milwaukee, WI, the focus of which was linking ecological research and science education. John participated in the MCLI Dialogue Day, "Introduction to Formative Classroom Assessment," hosted by Dr. Tom Angelo, which engaged participants in many novel formative assessment techniques. He also attended Web 2.0 training seminars, hosted by CTLT at Phoenix College to expose faculty to new online tools for course development. John wrote for and was awarded a CTLT grant to develop an online BIO 182 lecture course. He also collaborated with fellow Biology Department faculty member Ana Marti-Subirana and was awarded a Title 5 Mini Grant to co-develop consistent student assessment modules between BIO 181 and BIO 182.

Student Intern Accomplishments

Theresa Becker, student intern and Traut Environmental Scholarship recipient: As an intern, Ms. Becker reports having "had incredible opportunities that have not only provided Phoenix College with new resources for the curriculum but have allowed me to learn more than I ever anticipated upon entering the department." Over the last nine months, she researched new subject matter, wrote protocols, assisted in the purchasing of equipment, developed relationships with scientists at the University of Arizona and the United States Department of Agriculture (USDA) Arid-Land Agricultural Research Center, and acquired basic laboratory skills. Ms. Becker gained a hands-on understanding of plant tissue culturing and pollen germination techniques meeting with the USDA Arid-Land Agricultural Research Center researchers to observe and develop skills in plant tissue culture for the application in Biology Department student activities. In the biology labs at Phoenix College she grew plant callus tissue and maintained it for almost two months in addition to writing a protocol for culturing Begonia Rex. As an assistant to the Environmental Biology instructor Ms. Becker accompanied the class on field trips to the Rio Salado Restoration Area to assist students with various field skills such as plant transects, orienteering exercises and bird identification also helping to write a lab exercise showing the relationship between weather and ground level ozone which will be incorporated into the curriculum in the fall of 2009. She trained in the effective use of GPS devices and software to accomplish the lab activities. Additionally, Ms. Becker has been trained by our faculty and staff in the use of standard and advanced lab equipment and techniques

Yan Lee, Peoria High School student: Yan Lee interned at the Biology Department during fall of 2008, during which she learned basic lab techniques and procedures and contributed to developing the plant tissue culture experiment, microbial experiments, and greenhouse plant procedures.

Department Plans, Strategies, and Challenges

Strategies to Address Resource Needs

Because our curriculum has a strong science skill development component that requires the extensive use of current laboratory equipment and computers, Mark Rosati and Jim Neuenfeldt structured student fees to meet the needs of student activities in both lecture and lab portions of biology classes. Fee amounts reflect the cost of expendable supplies and equipment purchases and maintenance.

Our faculty and staff also regularly apply for funds to enhance existing curriculum in skill development or to develop new student activities. Several faculty have received grants to advance student support in the form of computer software to develop Internet-based student access to course materials outside of class time and in-class applied technologies called student responders.

Hiring Faculty

The most important asset of the Biology Department is our faculty and staff. The past, current and future success of the Biology Department relies on classroom activities and courses offered. Faculty and staff that create, develop and implement class activities and curriculum play a central role in our success. Every full time faculty and several adjunct faculty routinely improve the classroom environment and activities related to the delivery of curriculum in substantive ways. With retirements not being replaced, the Biology Department requires additional faculty to achieve our goals.

In addition, we have found that, over years of recruiting faculty, in order to be competitive with other colleges and universities in Arizona and across the country, we must advertise and interview for new position during the fall semester. We have lost outstanding candidates again and again because other colleges have issued earlier offers—including other colleges with MCCCD. This seems to be an "easy fix" that would enable the Biology Department to continue to hire excellent faculty.

Curriculum Development and Advancement

As discussed in this report, the Biology Department faculty is one of the most active biology departments in the review, revision and development of curriculum in the District. Unfortunately, the MCCCD process for officially revising and creating new curriculum is lengthy and bureaucratic, and the process is subject to a small minority vetoing excellent and progressive new curriculum and curriculum changes. For example, Dr. Pepe put together a new multi-disciplinary curriculum in Environmental Science, through a widely inclusive process that included all interested science departments. The curriculum did not pass because of a failure of the Phoenix College and District administration to champion and support the curriculum in the face of controversy from one department. In the future, we would like to see more consistent follow-through from administration in support of curriculum development efforts to ensure that Phoenix College is able to compete with interesting and timely curriculum that meets the needs of our community.

Student success and retention rates can be increased by the implementation of student activities that actively engage students in skill development. Some new approaches for retention and student success used by faculty are to require students to have regularly scheduled individual meetings with their instructor. These meetings are used to review individual grades and performance in class and for advisement purposes. Several faculty require students to tour and meet with Learning Services staff, access library resources and other student support amenities on campus to familiarize students with campus student success support facilities.

Online and Hybrid Courses

To increase and maintain student enrollment and retention, the Biology Department is increasing the number of fully online and hybrid online course offerings.

This attracts students that have limited access because of work, parental responsibilities and disabilities, and also give us the potential to reach new markets outside of Phoenix (and outside of Arizona). We have increased the number of fully online and hybrid courses this past year, including our first offering of fully on line BIO 100 for Fall 08, BIO 181 (majors biology) as a hybrid and our first offering of BIO 160 fully online.

We use enrollment trends, campus advisement Department advice, all of these sources of information to promote a higher quality experience for students while ensuring course offerings, meeting times, and alternative forms of delivery (i.e., internet) meet student demands and expectations.

Community Partnerships and Advisory Groups

The Biology Department has established a number of partnerships and community activities:

- Science Foundation Arizona – STEM Center
    - Department Chair, Mark Rosati was selected and serves as an Advisory Board member for the Arizona STEM Center
    - Partner contact:
        - Darcy Renfro – STEM Center Executive Director
- USDA U.S. Arid-Land Agricultural Research Center
    - Accepts PC biology student interns and trainees
- PUHSD Bioscience High School, Maryvale, and Arcadia High School
    - High School student dual enrollment
    - Science curriculum collaborative development
    - Equipment and supply sharing for high school student science labs
    - Science teacher workshops for professional growth
    - Partner and advisory contacts:
        - Bioscience High School Principal – Deedee Falls EdD.
        - Maryvale High School Science Division Chair – Amanda Chapman
        - Arcadia High School Science faculty Amy Bell
- Audubon Arizona
    - Rio Salado Education Center educational specification collaboration
    - Important Bird Areas Project grant proposal collaboration
    - Student internships
    - Partner and advisory contacts:
        - Sam Campana – Executive Director
- Native Seeds/Search and the Phoenix Desert Botanical Garden
    - Collaboration with horticultural research
    - Student internships
    - Partner and advisory contacts:
        - Bryn Jones – Executive Director
        - Jules Richelson – Volunteer Coordinator

- Environmental Fund for Arizona
    - Non-profit charitable organization for local Arizona conservation and Wildlife groups
    - Provides student internship connections for science students.
    - Partner and advisory contacts:
        - Laine Seaton – Executive Director
- Arizona Science Center
    - Biology faculty as AZ Science Center teachers for exhibitions
    - Student internships
    - Environmental Science instruction for 7-12 grade science teachers
    - Partner and advisory contacts:
        - Dianne McKee - Director of Educational Services
- Maricopa County Superintendent of Schools - Educational Services
    - Grant collaboration for science teacher education
    - Partner and advisory contacts:
        - Beth Hoye - Director of Educational Services
- University of Arizona
    - Biology Network at the University of Arizona - Student internships
    - Department of Hydrology and Water Resources – Arizona Rivers Project
    - Partner and advisory contact:
        - Dr. Martha P.L. Whitaker – Primary Investigator
        - Dr. James Washburne – Primary Investigator
- TGen and Sun Health
    - Student internships
    - Partner and advisory contact:
        - Dr. Candice Nulsen – TGen Science Education & Outreach Director