

**PROGRAM REVIEW**

**LIFE SCIENCE  
EL CAMINO COLLEGE, COMPTON CENTER**

**2011-12**

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## CONTENTS

Overview of Program .....	4
Description of Program.....	4
Degrees Offered.....	5
Status of Prior Program Review Recommendations: .....	5
Analysis of Institutional Research Data .....	6
Course grade distribution; success and retention rates.....	6
Overall success rates and retention.....	18
Enrollment.....	20
Scheduling of courses.....	18
Demographic profile.....	20
Related Recommendation.....	23
Curriculum.....	23
Courses: .....	23
Timeline for Course Review.....	25
Course Additions: .....	25
Degree courses.....	26
Articulation.....	26
Degrees, Certificates, and Licensure Exams .....	26
Related Recommendations .....	26
Student Learning Outcomes (SLOs).....	27
Program Level SLO's .....	27
Course Level SLOs:.....	27
Assessment Results and Recommendation.....	32
Program's Level of SLO Assessment /Implementation .....	32
Related Recommendations .....	33
Facilities, Equipment, and Technology .....	33
Adequacy and Currency of Facilities, Equipment, and Technology .....	33
Immediate (1-2years) Needs.....	34
Long Range (2-4 years) Needs .....	34
Related Recommendations .....	35

Staffing .....	3636
Current Staffing .....	36
Program’s immediate and long-range staffing needs .....	36
Related Recommendations .....	36
Direction and Vision.....	37
Prioritized Recommendations.....	38

## OVERVIEW OF PROGRAM

### Description of Program

The Life Science program is designed to prepare students interested in progressing to the paramedical/ pre-professional programs such as nursing, allied health, other health careers or those interested in transferring to four year colleges. Our program goal is to develop the students' understanding of biological principles, structure and function of living organisms and the interactions/ relationships with the physical aspects of the environment. We use an interdisciplinary approach to study man, animals and plants. The mission of the Life Science program is to:

- (1) Offer quality educational opportunities for students by providing courses that transfer to four-year institutions,
- (2) Offer associate degrees and certificate courses that meet general education requirements, and
- (3) Prepare students for entry into various health related fields and programs.

The learning outcomes expected from students completing the Life Science curriculum include: rich and current content knowledge, technical abilities to use appropriate scientific equipment, proficiency in expressing scientific content in written form, ability to apply the scientific method, and improve confidence and student attitudes toward Life Science.

The Life Science Program has a number of strengths. The curriculum in the discipline is current. All courses have recently undergone curriculum revisions to reflect current trends in the field of Life Science. In addition, non-majors have a selection of courses from which to choose in order to earn general education Life Science credit. The program is expanding with students who hunger for quality education. The program has six fulltime and seven part time instructors who are dedicated and very committed to the program.

The Life Science Program fulfills two roles for students – providing general education options for non-majors, lower division courses for majors and preparing students for entry into the allied health field. The non-major biology enrollment is increasing. It follows the trends of the student population at the Center since most general education programs require a Life Science course. The program is expected to expand to meet the needs of a growing demand for health care professionals. The curriculum will continue to be robust as it represents lower division requirements for non-biology majors, pre-health majors, and general education. The Program is

considering expansion of its course offerings to fulfill requirements for Biology majors. The faculty and students of the Life Science program are involved in campus-wide social programs such as celebrating different cultural and historical activities. These include among others, Martin Luther King Day, Cesar Chavez Day, Cinco de Mayo, Black History Month observance and festivities. We participate in symposia, cultural exhibits, and musical presentations.

### **Degrees Offered**

The program offers courses for students to graduate with an Associate in Science (A.S.) degree in Life Science.

### **Status of Prior Program Review Recommendations**

One of the main objectives of the program from previous program reviews that is evident from the last three years' program plans is to "stay current with developments in the field of Biology." The continued shift toward the molecular study of biology thus necessitates a commitment by the division to invest in the type of equipment and technology that is needed to offer courses in this area of Biology. Concepts related to Gel electrophoresis, DNA extraction and restriction mapping, polymerase chain reaction, and genetic recombination techniques could be introduced to produce graduates with knowledge in molecular biology and biotechnology. The program plan has requested that funding allocation be considered toward the purchase of such supplies as mentioned above, to allow for those types of experiments/ activities to be conducted each semester. Lack of funding may jeopardize the program articulation agreements with the local universities.

We have been able to acquire enough laboratory materials and supplies in the past year to service our current offerings. The expansion of the course offerings is predicated on the increase in the supply budget for needed lab requirements in the coming years. Funding for faculty training in the latest biological techniques and conferences/fieldtrips is still virtually non-existent. The Center has made available up to \$400 reimbursement for attending professional development activity or \$500 if presenting at a conference or workshop. We applaud this as a great step in the right direction. It will spur new interests in professional development but the Center could do better. Professional training in the Life Science usually lasts three to seven days and the cost of

training materials runs in the thousands. Both the Center and students stand to benefit immensely when the Center invests in the faculty.

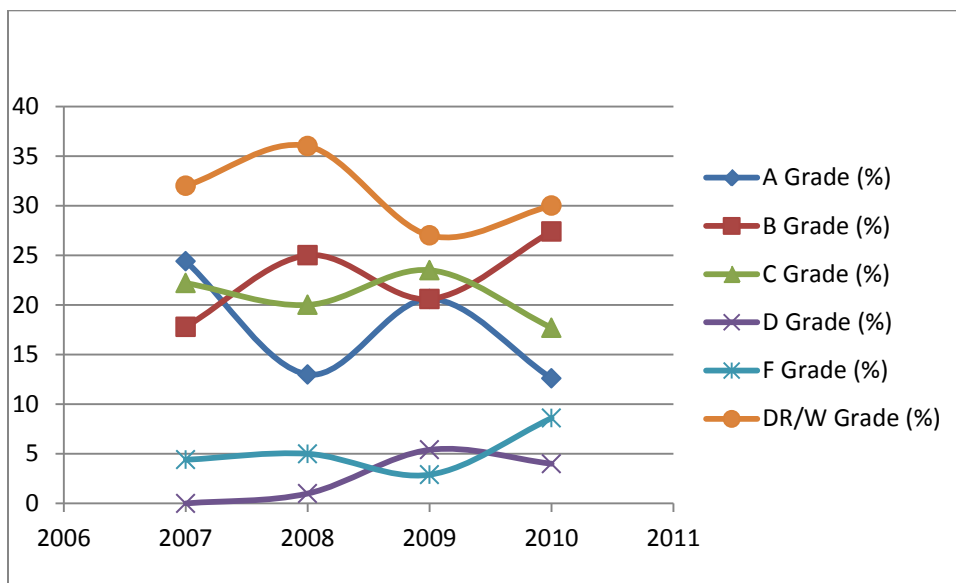
Preliminary data from the past three years indicate improvements in success and retention rates of students. It is believed that this is a reflection of the caliber and dedication of our faculty. We endeavor to prepare our students for success in life and in their professions. Our graduates go on to higher levels of study; with the majority going on to and successfully completing various nursing programs and training. Review of Student Learning Outcomes (SLO's), success, retention and transfer rates is ongoing.

## ANALYSIS OF INSTITUTIONAL RESEARCH DATA

### Course grade distribution; success and retention rates

#### *Anatomy 30*

The grade distribution and success and retention rates for Anatomy 30 from 2007 through 2010 are shown below (Figure 1 and Table 1). The percentage of students who completed the course with a B grade seems to show an increasing trend while the DR/W decreased during the period. Students with D and F grades moved up slightly as the A and C grades declined. The number of passing grades increased from 2007 through 2010 as the number of total grades increased (45-



**Figure 1: Grades (in percent) for years 2007-2010 for Anatomy 30.**

100-204-175). The success rates ranged between 58% and 64% during this time period. Our retention rate was between 64% and 73%. The success rates and retention rates stayed in a narrow range over the time period between 2007 and 2010, even though the distribution of A-B-C grades varied from year to year.

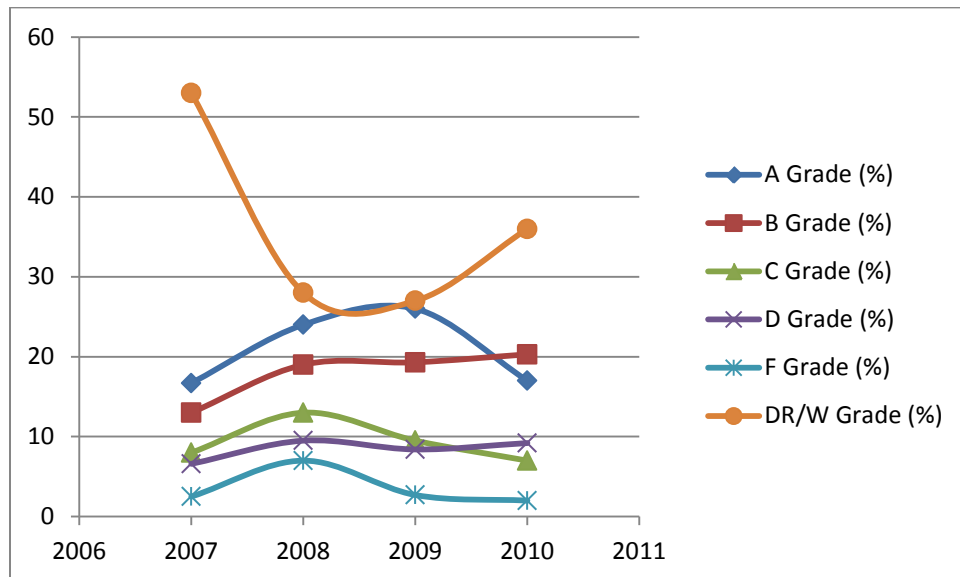
Table 1: Grade distribution and success and retention rates for Anat. 30 between 2007 and 2010

<b>ANA T 30</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>P</b>	<b>D</b>	<b>F</b>	<b>I</b>	<b>NP</b>	<b>DR</b>	<b>W</b>	<b>Total Grades</b>	<b>Success Rate</b>	<b>Retention Rate</b>
<b>2007</b>	11	8	10	0	0	2	0	0	1	13	45	64.4	68.9%
	24.4 %	17.8 %	22.2 %	0.0 %	0.0 %	4.4 %	0.0 %	0.0 %	2.2 %	28.9 %		%	
<b>2008</b>	13	25	20	0	1	5	0	0	15	21	100	58.0	64.0%
	13.0 %	25.0 %	20.0 %	0.0 %	1.0 %	5.0 %	0.0 %	0.0 %	15.0 %	21.0 %		%	
<b>2009</b>	42	42	48	0	11	6	1	0	14	40	204	64.7	73.5%
	20.6 %	20.6 %	23.5 %	0.0 %	5.4 %	2.9 %	0.5 %	0.0 %	6.9 %	19.6 %		%	
<b>2010</b>	22	48	31	0	7	15	0	0	17	35	175	57.7	70.3%
	12.6 %	27.4 %	17.7 %	0.0 %	4.0 %	8.6 %	0.0 %	0.0 %	9.7 %	20.0 %		%	

### **Anatomy 32**

The grade distribution and success and retention rates for Anatomy 32 from 2007 through 2010 are shown below (Figure 2, Table 2). The total number of passing grades awarded increased along with total number of grades from 2007 through 2010 (198-200-296-295). Students with grades A and C decreased while B and D gradually increased. The percent of students with an F grade stayed almost the same while the DR/W grade dropped from 2007 till 2009 but increased in 2010. The success rates ranged from 38 to 61% during the period and our retention rate was from 47% to 72% Anatomy is the first of a series of three classes in the program that is required in order to progress to nursing school. The success and retention rates in the year 2007 were below 50%. This was when the college just recovering from the loss of accreditation and the

population was very thin in number and diversity. The following two years indicated improvements in numbers and performance of the students. In 2010, the A and C grades dropped



**Figure 2: Grades (in percent) for years 2007-2010 for Anatomy 32.**

**Table 2: Grade distribution and success and retention rates for Anat. 32 between 2007 and 2010**

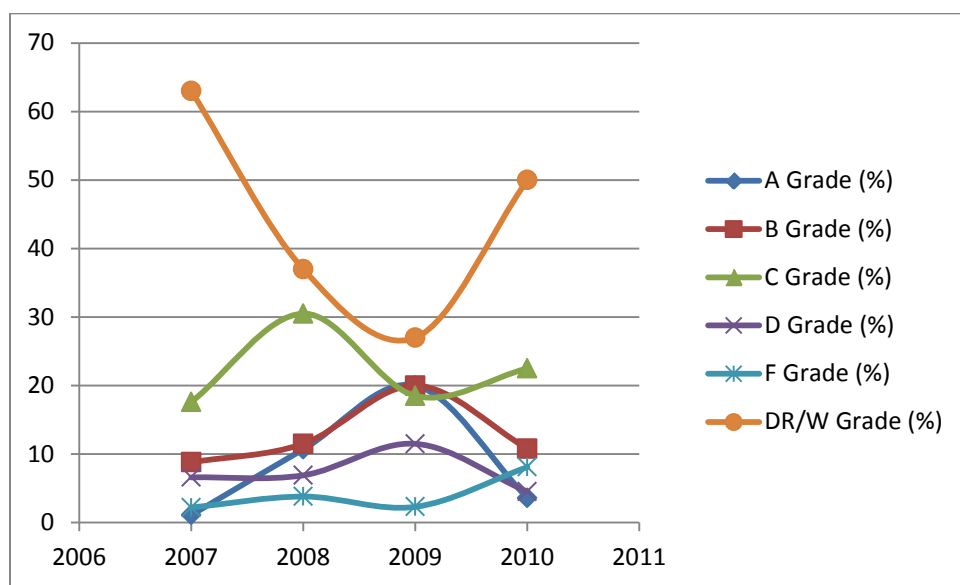
<b>ANA T 32</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>P</b>	<b>D</b>	<b>F</b>	<b>I</b>	<b>NP</b>	<b>DR</b>	<b>W</b>	<b>Total Grade s</b>	<b>Succ ess rate</b>	<b>Rete ntion Rate</b>
<b>2007</b>	33	26	16	0	13	5	0	0	26	79	198	37.9%	47.0%
	16.7 %	13.1 %	8.1 %	0.0 %	6.6 %	2.5 %	0.0 %	0.0 %	13.1 %	39.9 %			
<b>2008</b>	48	38	26	0	19	14	0	0	15	40	200	56.0%	72.5%
	24.0 %	19.0 %	13.0 0%	0.0 %	9.5 %	7.0 %	0.0 %	0.0 %	7.5 %	20.0 %			
<b>2009</b>	77	57	48	0	25	8	0	0	27	54	296	61.5%	72.6%
	26.0 %	19.3 %	16.0 2%	0.0 %	8.4 %	2.7 %	0.0 %	0.0 %	9.1 %	18.2 %			
<b>2010</b>	52	60	43	0	27	6	0	0	20	87	295	52.5%	63.7%
	17.6 %	20.3 %	14.0 6%	0.0 %	9.2 %	2.0 %	0.0 %	0.0 %	6.8 %	29.5 %			



with an increase in the drops. In the Fall 2010 semester, two new full time tenure track faculty members joined the team as enrollment and course sections were increasing.

### ***Biology 10***

Figure 3 and Table 3 show the grade distribution and success and retention rates in Biology 10 from 2007 through 2010. The percentage of students with grades A, B, C, and D increased from 2007 to 2009 but decreased in 2010. The decrease corresponds to the increase in the DR/W and F grades in 2010. The success rates and retention rates ranged from 27% to 58% and from 47% to 73% respectively, during this time period. The total number of passing grades increased from 2007 through 2010 (91-131-130-111) as did the total number of grades.



**Figure 3: Grades (in percent) for years 2007-2010 for Biology 10.**

The variations in the A-B-C grade distribution as well as the elevated drop/withdraw rates in 2010 may reflect a number of reasons. One reason may be the increase in the total number of under prepared students attempting Biology 10. The Center’s recruitment efforts continue to bring in more fresh high school graduates from the feeder schools than before. These students that were just graduating from high school were probably not ready to handle the rigor of a college lab science class. Furthermore, Bio-10 is not a course that is required for entry into many

post graduate health programs. By tradition, Biology 10 attracts non science majors and students who need a transferable science class (with lab) to satisfy general education requirements to

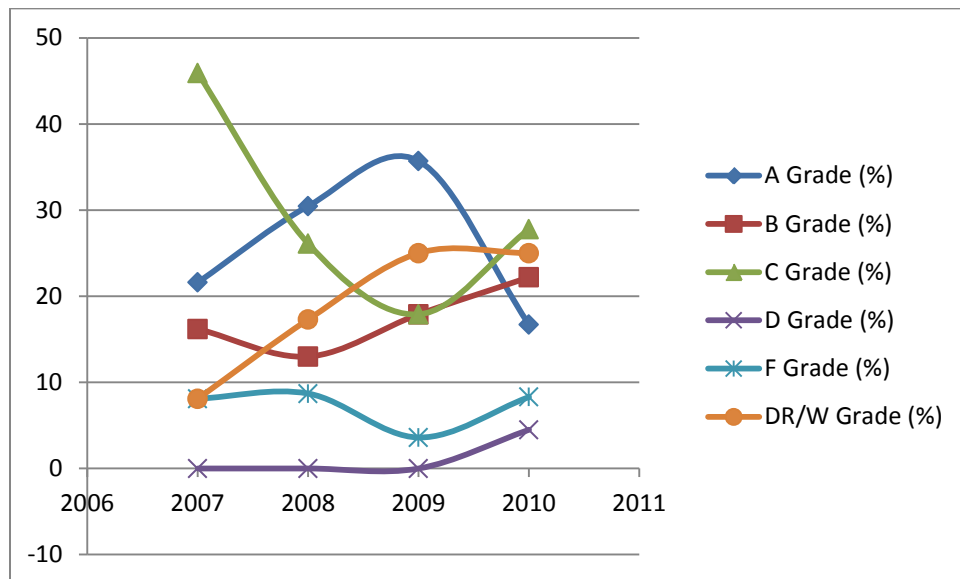
Table 3: Grade distribution and success and retention rates for Biol. 10 between 2007 and 2010

<b>BIO L 10</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>P</b>	<b>D</b>	<b>F</b>	<b>I</b>	<b>NP</b>	<b>DR</b>	<b>W</b>	<b>Total Grades</b>	<b>Success rate</b>	<b>Retention Rate</b>
<b>2007</b>	1	8	16	0	6	2	7	0	26	25	91	27.5	44.0
	1.1 %	8.8 %	17.6 %	0.0 %	6.6 %	2.2 %	7.7 %	0.0 %	28.6 %	27.5 %		%	%
<b>2008</b>	14	15	40	0	9	5	0	0	12	36	131	52.&	63.4
	10.7 %	11.5 %	30.5 %	0.0 %	6.9 %	3.8 %	0.0 %	0.0 %	9.2 %	27.5 %		%	%
<b>2009</b>	26	26	24	0	15	3	1	0	10	25	130	58.5	73.1
	20.0 %	20.0 %	18.5 %	0.0 %	11.5 %	2.3 %	0.8 %	0.0 %	7.7 %	19.2 %		%	%
<b>2010</b>	4	12	25	0	5	9	0	0	5	51	111	36.9	49.5
	3.6 %	10.8 %	22.5 %	0.0 %	4.5 %	8.1 %	0.0 %	0.0 %	4.5 %	45.9 %		%	%

transfer into four year institutions. Occasionally we get high school students who are prepared enough to take this class and use this course as transferable units for College (or high school). Even though it is not shown here, the Bio-10 classes offered in the winter and summer sessions in the past years were almost always full. This is because this course was taken by many ‘reverse-transfer’ non-science majors from nearby four-year universities to complete their natural science requirement for graduation from the institutions. Bio-10 classes could be offered as a catch for recruiting new students that would take future classes at the El Camino College, Compton Educational Center.

### ***Biology 15***

Figure 4 and Table 4 show the grade distribution and success and retention rates in Biology 10 from 2007 through 2010. Only the A grades awarded dropped in 2010 while all the other grades recorded increases as from previous years. The success rates ranged from 69% to 83% during this time period. Our retention rate ranged from 75% to 91.9%. The total number of grades remained constant from 2007 through 2010 (37-23-28-36).



**Figure 4: Grades (in percent) for years 2007-2010 for Biology 15.**

Biology 15 is not a requirement for postgraduate healthcare programs and attracts students who need only a transferable natural science class to fulfill of their Associate degree requirements or to transfer to other institutions. This course does not include a lab component and is primarily content based. The success rate is high and may reflect the fact that students need a C (or better) to transfer. Only two sections of Bio-15 used to be offered during regular semesters. We may need to look at sections offered in summer sessions to get more data. Unfortunately, we replaced Biol-15 with Biol-17 in Fall 2011.

The Biology courses also need to be examined in terms of the great disparity of the success and retention rates among its faculty. There should be dialogue among biology instructors to explore techniques that can be utilized in order to raise the success and retention rates in biology to an acceptable level, more in line with the program and college norm.

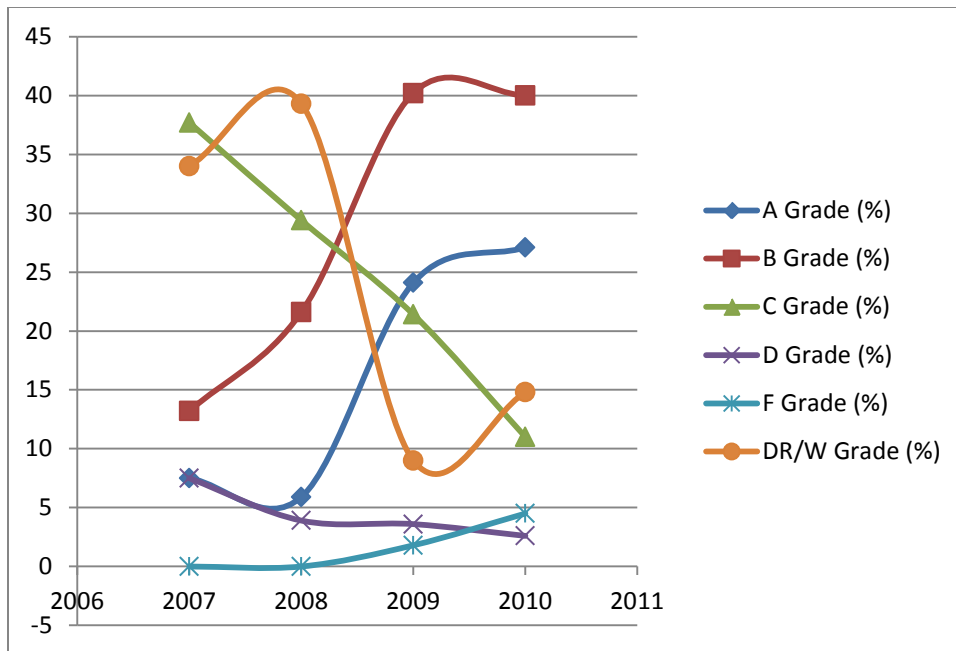
Table 4: Grade distribution and success and retention rates for Biol. 15 between 2007 and 2010

BIOL 15	A	B	C	P	D	F	I	NP	DR	W	Total Grades	Success Rate	Retention Rate
2007	8	6	17	0	0	3	0	0	0	3	37	83.8	91.9
	21.6 %	16.2 %	45.9 %	0.0 %	0.0 %	8.1 %	0.0 %	0.0 %	0.0 %	8.1 %		%	%
2008	7	3	6	0	2	1	0	0	3	1	23	69.6	82.6
	30.4 %	13.0 %	26.1 %	0.0 %	8.7 %	4.3 %	0.0 %	0.0 %	13.0 %	4.3 %		%	%
2009	10	5	5	0	0	1	0	0	5	2	28	71.4	75.0
	35.7 %	17.9 %	17.9 %	0.0 %	0.0 %	3.6 %	0.0 %	0.0 %	17.9 %	7.1 %		%	%
2010	6	8	10	0	3	0	0	0	1	8	36	66.7	75.0
	16.7 %	22.2 %	27.8 %	0.0 %	8.3 %	0.0 %	0.0 %	0.0 %	2.8 %	22.2 %		%	%

### ***Microbiology 33***

The grade distribution for microbiology 33 from 2007 through 2010 is shown below (Figure 5). Success rates and retention rates are also shown in Table 5. The number of students who completed Microbiology 33 with A or B grades increased considerably from 2007 through 2010. The numbers for C, D, and DR/W fell accordingly. The success rates ranged between 56.9% and 85% during this period and our retention rates were between 66% and 78.4 % respectively. The total number of grades awarded and the number of passing grades increased from 2007 through 2010 (79-106-153-176).

Microbiology 33 is a requirement for most postgraduate healthcare programs and attracts many students who are at the end of their training and ready to enter postgraduate health programs. The success rate may reflect the fact that most healthcare programs require a 2.5 or higher G.P.A. in the Life Science selective classes. The students at the Compton Center pursue that goal with aggressive study and diligence to master the material. The positive change evident between 2008 and 2009 showing an increase in the percent of A and B grades and a drop in the C and DR/W resulted as new full timers joined the faculty and injected vigor into the students and their work.



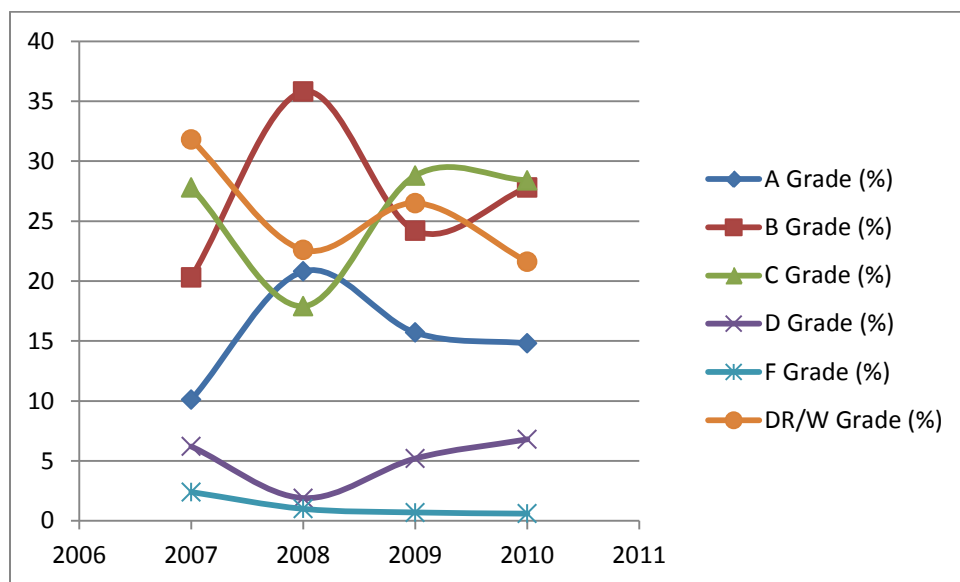
**Figure 5: Grades (in percent) for years 2007-2010 for Microbiology 33.**

**Table 5: Grade distribution and success and retention rates for Micr. 33 between 2007 and 2010**

MIC R-33	A	B	C	P	D	F	I	NP	DR	W	Total Grades	Success Rate	Retention Rate
2007	4	7	20	0	4	0	0	0	9	9	53	58.5	66.0
	7.5%	13.2%	37.7%	0.0%	7.5%	0.0%	0.0%	0.0%	17.0%	17.0%		%	%
2008	3	11	15	0	2	0	0	0	6	14	51	56.9	60.8
	5.9%	21.6%	29.4%	0.0%	3.9%	0.0%	0.0%	0.0%	11.8%	27.5%		%	%
2009	27	45	24	0	4	2	0	0	2	8	112	85.7	91.1
	24.1%	40.2%	21.4%	0.0%	3.6%	1.8%	0.0%	0.0%	1.8%	7.1%		%	%
2010	42	62	17	0	4	7	0	0	5	18	155	78.1	85.2
	27.1%	40.0%	11.0%	0.0%	2.6%	4.5%	0.0%	0.0%	3.2%	11.6%		%	%

### ***Physiology 31***

The grade distribution, for Physiology 31 from 2007 through 2010 is shown below (Figure 5). Success rates and retention rates are also shown in Table 5. Relatively fewer students completed Physiology 31 with an A grade. Majority of our students end up with B or C grades. The percentage of DR/W grades during 2007 through 2010 was close to the C grades. The success rates ranged between 58% and 74.5% during this period and our retention rates were between 68.4% and 78.4 % respectively. The total number of grades awarded and the number of passing grades increased from 2007 through 2010 (79-106-153-176).



**Figure 6: Grades (in percent) for years 2007-2010 for Physiology 31.**

Physiology 31 is a requirement for most postgraduate healthcare programs and attracts many students who are at the end of their preparation and ready to enter professional training. In addition, many health programs limit the number of times a student can attempt pre-requisite classes and if the student is not performing as needed to get into a program, they will drop the class (receive W or NG) before the last drop date. This may be a factor responsible for the wide range of the success rates in Physiology 31 and the relatively high DR/W grades (Figure 6 and Table 6). One factor contributing to a higher percentage of students completing the Physiology 31 course is because most physiology students have successfully passed the prerequisite courses of anatomy and chemistry, and are better prepared to take Physiology 31.

Table 6: Grade distribution and success and retention rates for Phyto 31 between 2007 and 2010

<b>PHY O 31</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>P</b>	<b>D</b>	<b>F</b>	<b>I</b>	<b>NP</b>	<b>DR</b>	<b>W</b>	<b>Total Grades</b>	<b>Success Rate</b>	<b>Retention Rate</b>
<b>2007</b>	8	16	22	0	8	0	0	0	6	19	79	58.2%	68.4%
	10.1 %	20.3 %	27.8 %	0.0 %	10.1 %	0.0 %	0.0 %	0.0 %	7.6 %	24.1 %			
<b>2008</b>	22	38	19	0	2	1	0	0	7	17	106	74.5%	77.4%
	20.8 %	35.8 %	17.9 %	0.0 %	1.9 %	0.9 %	0.0 %	0.0 %	6.6 %	16.0 %			
<b>2009</b>	24	37	44	0	8	0	1	0	4	35	153	68.6%	74.5%
	15.7 %	24.2 %	28.8 %	0.0 %	5.2 %	0.0 %	0.7 %	0.0 %	2.6 %	22.9 %			
<b>2010</b>	26	49	50	0	12	1	0	0	5	33	176	71.0%	78.4%
	14.8 %	27.8 %	28.4 %	0.0 %	6.8 %	0.6 %	0.0 %	0.0 %	2.8 %	18.8 %			

### **Life Science Overall Success Rates and Retention Rates**

Life Science courses recorded an overall improvement from 2007 through 2009 in both success rates and student retention rates but a slight drop in the year 2010 (Figures 7 and 8) substantially improved in both success and retention rates. In 2009, we exceeded the state average in our success rates; and improved to within 5 percentage points of the state average in retention rates during the same year (Figures 7 and 8, below.) The recruitment efforts to bring in a diversified student population (like the brother-brother program which encourages young men in the community to return to school), improved lab resources, and a dedicated team of faculty could be responsible for the improved success and retention rates.

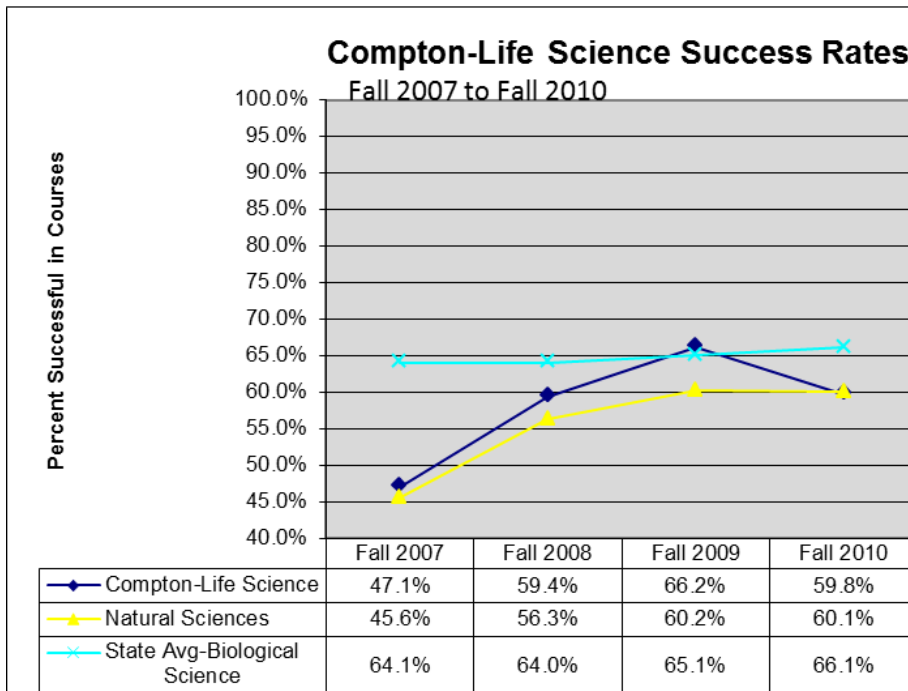


Figure 7: Life Science Success Rates (2007-2010) compared to all sciences and state averages

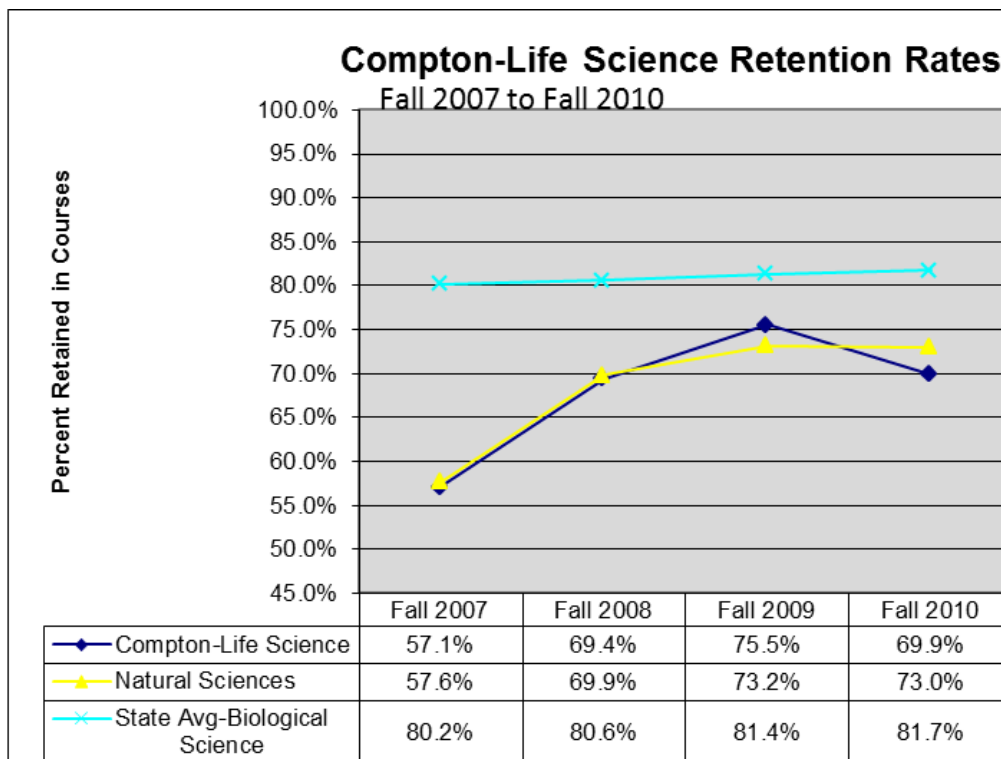


Figure 8: Life Science Retention Rates (2007-2010) compared to all sciences and state averages



## Enrollment

### *Section and seat counts and fill rates*

Our section and seat counts almost doubled in the years 2007 through 2010 from 1401 to 2660 respectively (Table 7, Figure 9). The average student in the Life Science program takes 1.2 Life Science courses. Our enrollment statistics show an increase in sections from 47 to 74 in the same period. Increases in seat count and number of sections may be attributed to the aggressive recruitment of students by the Center and the quality of education and services provided by the faculty and staff in the program. Many employer based programs are being created to fill their need for healthcare workers. Students typically enroll in the community college courses because of time offerings and costs. This has produced a greater than 100% increase in student enrollment over the four year period.

Table 7: Annual Seat Count for Compton Center Life Science from 2007-2010.

	2007-08	2008-09	2009-10	2010-11	4 yr Average
Seat Count	1401	1832	2455	2660	2087

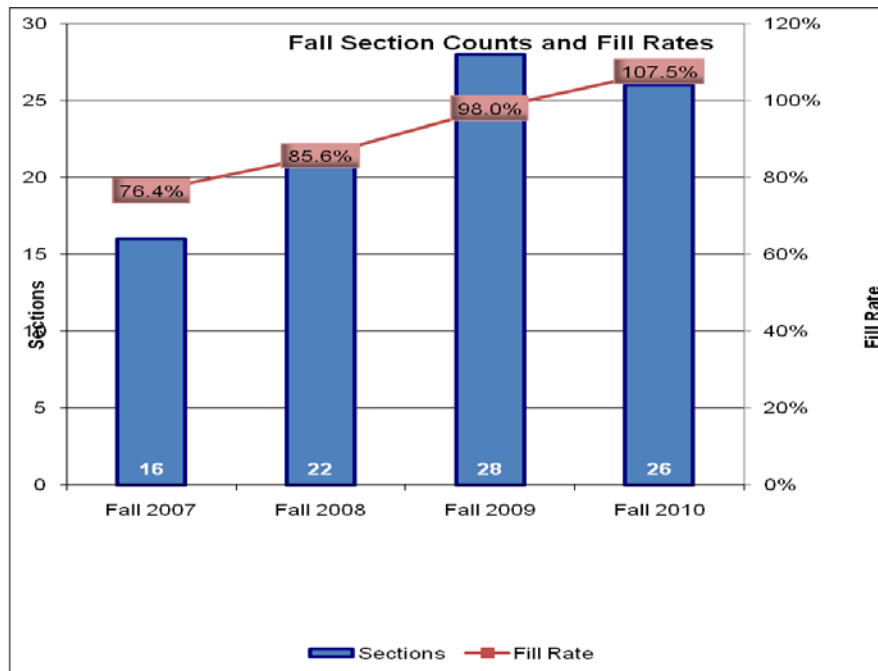


Figure 9: Section Count and Fill Rates for Life Science from 2007 – 2010.

## Scheduling of courses

Our courses are scheduled Monday through Saturday, with each class holding twice or once a week (Mon/Wed, Tue/Thu, all day Friday or Saturday). We have classes scheduled between 8am to 10pm. Most class start times are at 8:00a.m., 2:00p.m., and 5.30p.m (Table 8). In general, all sections fill quickly with many students waitlisted as well. Our student enrollment for both day and night classes has remained steady at approximately 68% day students and 32% night students with a slight variation in 2010 (79.8% vs. 20.2% day/night students; see table 9) .

Biology 15 (Aspects of Environmental Science) was replaced with Biology 17 during the fall 2012. The change was implemented to provide some variation in the list of course offerings so that students with a different field of interest could be attracted. This is also to offer additional new non-major courses.

Table 8: A typical semester course schedule in the Life Science Program

### MONDAY/ WEDNESDAY

8:00-9:25AM	9:30-12:25AM	12:30-4:55PM	5:00-6:25PM	6:30-10:00PM
ANAT 32 # 9815 LEC M 8:00-8:50 LEC W 8:00-9:05 MS 110 LAB 9:15-12:25 LAB MS 110	MICR 33 # 9876 LEC 9:30-10:55 LEC MS 107 LAB 11:00-2:10 LAB MS 107	ANAT 32 # 9816 LEC M 2:00-2:50 LEC W 2:00-3:05 LAB 3:05-6:15 MS 110	PHYO 31 # 9884 LEC M 5:15-6:05 LEC 5:15-6:20 LEC MS 103 LAB 6:30-9:40 LAB MS 108	ANAT 30 # 9811 LEC M 5:30-6:20 LEC W 5:30-6:35 MS 105 LAB 6:35-9:45 MS 128
PHYO 31 # 9881 LEC M 8:00-8:50 LEC W 8:00-9:05 MS 103 LAB 9:15-12:25 LAB MS 108		BIOL 10 # 9837 LEC 1:00-2:25 LAB 2:30- 3:55 MS 108	MICR 33 # 9877 LEC 5:15-6:40 LEC MS 107 LAB 6:45-9:45 LAB MS 107	ANAT 32 # 9820 LEC M 5:30-6:20 LEC 5:30-6:35 LEC MS 208 LAB 6:35-9:45 LAB MS 110

TUESDAY/THURSDAY

8:00-9:25AM	9:30-10:55AM	2:00-4:55PM	5:00-6:25PM	6:30-10:00PM
ANAT 32 # 9814 LEC T 8:00-8:50 LEC H 8:00-9:05 MS 110 LAB 9:15-12:25 LAB MS 110	MICR 33 # 9875 LEC 8:00-9:25 LEC MS 107 LAB 9:30-12:40 LAB MS 107	ANAT 32 # 9817 LEC T 2:00-2:50 LEC H 2:00-3:05 LEC MS 110 LAB 3:10-6:20 MS 110	MICR 33 # 9878 LEC 5:15-6:40 LAB 6:45-9:55 MS 107	BIOL 10 # 9839 LEC 5:30-6:55 LAB 7:00-8:25 MS 108
PHYO 31 # 9883 LEC T 8:00-8:50 LEC H 8:00-9:05 MS 103 LAB 9:15-12:25 LAB MS 108			ANAT 30 # 9812 LEC T 5:30-6:20 LEC H 5:30-6:35 MS 105 LAB 6:35-9:45 MS 128	

FRIDAY/ SATURDAY

ANAT 30 # 9809 FRI 8:00-10:20 LEC MS 103 FRI 10:30-4:45 LAB MS 110	BIOL 17 # 9841 FRI 9:00-12:35 9-02 TO 12-16 MS105	PHYO 31 # 9880 SAT LEC 8:00-10:05 MS 103 SAT LAB 10:15-4:45 MS 107
ANAT 32 # 9813 LEC SAT 8:00-10:05 LAB 10:15-4:45 MS 110	ANAT 30 # 9808 LEC H/F 9:00-10:05 MS 128 LAB H/F 10:10-1:15 MS 128	BIOL 10# 9835 LEC SAT 9:00-12:10 LAB SAT 12:10-3:20 MS 108

## **Demographic Profile**

The demographic profile and student enrollment in the Life Science Program is shown in Table 9 below. Table 9 provides information on several aspects of the enrollment in Life Science (2007 to 2010) and also the Compton Center and Compton CCD from the 2010 census.

### ***Gender***

The ratio of male to female students has been fairly constant from 2007-2010; with female students in the majority, approximately 75% female to 25% male students. Over this time span the data shows the following statistics:

- The female student ratio has slightly decreased 76.9% to 73.9% (-3%)
- The male % has slightly increased 22.9% to 26.1% (+3%)
- The female/male ratio is significantly higher than the Center's ratio

There are many possible reasons for the high ratio of female students. Our program has always attracted a majority of students primarily interested in nursing and other healthcare careers. Nursing offers a variety of employment opportunities ranging from clinical nursing to healthcare administration and teaching. These career fields have traditionally been filled by women. In recent years, more males are venturing into the medical field, lowering the female/male ratio but our female population still remains slightly higher than the general student population.

### ***Ethnicity***

All groups in the Compton CCD enrolled in Life Science courses. African Americans (38.2%) were the highest represented in our classes followed by Latinos (29.5%). It is interesting to note that Latinos who actually made up 69.5% of the CCCD population in the 2010 census; three times the number of African Americans (22.2%) were not equally represented in our classes and the campus as a whole. Other groups in our classes including Asians and White had numbers higher than the CCCD population. Efforts at the Center should reach out to Latinos that were poorly represented during the period under study.

### ***Age groups***

The age distribution in Life Science classes reflected all groups of the CCCD population. The

two largest age groups on the campus were the 25-29 (14.9%) and the 30-39 (14.1%). These two groups were also the largest in Life Science (21.8% and 19.7% respectively). The other age groups, especially those under 20 years were less represented in the Life Science program. They might still be trying to figure out which major/career they would like to pursue in the future.

### ***Class Loads and Class Times***

A large number of our students in the 2007-2010 period were part time students. As indicated in the section above, the 25-39 age group who were most likely gainfully employed were the largest group. Majority of the students in this group would be those trying to progress in their careers or those trying to change careers. The number of part time students on the campus was 63.8% while the number in Life Science is 80.8%. In the same vein, the percentage of students who preferred evening classes during the 2007-2010 period was 36.5% compared to the Center with 23.3%.

### ***Academic Level and Educational Goal***

In the fall 2010 like in previous years, high school graduates were the majority of students taking Life Science courses (73.2%). This is similar to the Center's students who were also high school graduates during the same semester (72.2%). However, Life Science had 24.3% of its students with an AA degree or higher while only 10.4% of students on the campus had an AA or higher. Students on the campus and in the Life Science program indicated similar educational goals. The students that indicated the intention to transfer constituted 30.5% of our students and 31.5% of the students on the campus. Students enrolled in Life Science who were undecided totaled 16.6% and those with goals unknown were 30.9% while 16.9% of students at the Center were undecided and 28.8% indicated their goals as unknown.

**Table 9: Demographic and Enrollment Characteristics in Life Science Fall 2007 to Fall 2010**

Characteristic	Category									Fall 2010		2010 Census	
		Fall 2007		Fall 2008		Fall 2009		Fall 2010		Compton	Compton District	n	%
		n	%	n	%	n	%	n	%	n	%	n	%
<b>All Enrolled</b>	Total	481	100.0%	595	100.0%	883	100.0%	904	100.0%	8,734	100.0%	320,280	
<b>Gender</b>	Female	370	76.9%	453	76.1%	660	74.7%	668	73.9%	5,585	63.9%	165,483	51.7%
	Male	110	22.9%	142	23.9%	223	25.3%	236	26.1%	3,144	36.0%	154,797	48.3%
	Unknown	1	0.2%	0	0.0%	0	0.0%	0	0.0%	5	0.1%	0	0.0%
<b>Ethnicity</b>	African-American	216	44.9%	301	50.6%	336	38.1%	345	38.2%	3,889	44.5%	71,111	22.2%
	Amer. Ind. or Alaskan	2	0.4%	1	0.2%	1	0.1%	2	0.2%	12	0.1%	507	0.2%
	Asian	58	12.1%	60	10.1%	119	13.5%	148	16.4%	643	7.4%	6,791	2.1%
	Latino	152	31.6%	175	29.4%	313	35.4%	267	29.5%	3,196	36.6%	222,443	69.5%
	Pacific Islander	6	1.2%	9	1.5%	8	0.9%	12	1.3%	91	1.0%	1,783	0.6%
	White	18	3.7%	20	3.4%	30	3.4%	65	7.2%	422	4.8%	14,180	4.4%
	Unknown or Decline	29	6.0%	29	4.9%	63	7.1%	43	4.8%	261	3.0%	580	0.2%
<b>Age/Age Group</b>	Under 17	0	0.0%	8	1.3%	1	0.1%	2	0.2%	611	7.0%		
	17	15	3.1%	9	1.5%	7	0.8%	7	0.8%	418	4.8%	102,775	32.1%
	18	18	3.7%	25	4.2%	25	2.8%	27	3.0%	618	7.1%	12,161	3.8%
	19	38	7.9%	47	7.9%	53	6.0%	51	5.6%	788	9.0%		
	20	34	7.1%	42	7.1%	69	7.8%	83	9.2%	776	8.9%	5,750	1.8%
	21	33	6.9%	30	5.0%	69	7.8%	70	7.7%	645	7.4%	5,349	1.7%
	22	38	7.9%	39	6.6%	61	6.9%	54	6.0%	486	5.6%		
	23	32	6.7%	44	7.4%	51	5.8%	65	7.2%	442	5.1%	15,852	4.9%
	24	23	4.8%	33	5.5%	67	7.6%	55	6.1%	355	4.1%		
	25-29	104	21.6%	116	19.5%	162	18.3%	197	21.8%	1,305	14.9%	24,075	7.5%
	30-39	83	17.3%	123	20.7%	186	21.1%	178	19.7%	1,232	14.1%	45,767	14.3%
	40-49	50	10.4%	54	9.1%	95	10.8%	83	9.2%	696	8.0%	41,970	13.1%
50-64	11	2.3%	24	4.0%	36	4.1%	31	3.4%	336	3.8%	43,435	13.6%	
65+	1	0.2%	1	0.2%	1	0.1%	1	0.1%	26	0.3%	23,146	7.2%	
<b>Class Load</b>	Full-time	119	24.7%	166	27.9%	182	20.6%	174	19.2%	1,629	18.7%		
	Part-time	362	75.3%	428	71.9%	686	77.7%	730	80.8%	6,012	68.8%		
	Not enrolled or N/A	0	0.0%	1	0.2%	15	1.7%	0	0.0%	1,093	12.5%		
<b>Time of Classes*</b>	Daytime	344	71.5%	409	68.7%	562	63.6%	574	63.5%	6,095	69.8%		
	Evening	137	28.5%	186	31.3%	321	36.4%	330	36.5%	2,037	23.3%		
	Unknown	0	0.0%	0	0.0%	0	0.0%	0	0.0%	602	6.9%		
<b>Academic Level</b>	AA or Higher	77	16.0%	102	17.1%	177	20.0%	220	24.3%	909	10.4%		
	HS Graduate	357	74.2%	455	76.5%	668	75.7%	662	73.2%	6,310	72.2%		
	Not a HS Grad	9	1.9%	14	2.4%	10	1.1%	3	0.3%	315	3.6%		
	K-12 Special Admit	12	2.5%	11	1.8%	8	0.9%	5	0.6%	973	11.1%		
	Unknown	26	5.4%	13	2.2%	20	2.3%	14	1.5%	227	2.6%		
<b>Educational Goal</b>	Intend to Transfer	191	39.7%	223	37.5%	292	33.1%	276	30.5%	2,752	31.5%		
	Degree/Certif. Only	56	11.6%	79	13.3%	79	8.9%	66	7.3%	608	7.0%		
	Retrain/recertif.	43	8.9%	44	7.4%	44	5.0%	71	7.9%	484	5.5%		
	Basic Skills/GED	13	2.7%	16	2.7%	16	1.8%	34	3.8%	607	6.9%		
	Enrichment	19	4.0%	19	3.2%	19	2.2%	28	3.1%	280	3.2%		
	Undecided	78	16.2%	96	16.1%	96	10.9%	150	16.6%	1,480	16.9%		
	Unknown	81	16.8%	118	19.8%	118	13.4%	279	30.9%	2,523	28.9%		

### **Related Recommendation**

The program should continue to support students, especially male students to fully serve the community and the need of the health care industry. Faculty should work closely with the Outreach program and continue to participate in community outreach programs to actively recruit male students; especially those of the minority groups.

There is an urgent need for more open Life Sciences labs, since examining 15-20 histology or biology slides in one lab session, with no chance to review is one of the biggest challenges students are facing. The students in the program would benefit greatly from dedicated tutors. Classroom MS105 could be designated tutoring room so that tutoring is available to students all day. The program would also like to see more materials purchased for the sole purpose and use by the tutors/SI leaders. The close proximity to the laboratories and biology faculty would make an ideal setting for answering questions and allowing students to work with high-tech equipment that are too costly to provide to the campus wide LRC.

## **CURRICULUM**

### **Courses**

Detailed descriptions of the courses currently taught in the Life Science Program are available in the El Camino College catalog but are briefly described below:

#### ***Anatomy 30 (Essentials of Anatomy and Physiology, 4units)***

Students compare the structure and function of human organ systems to those of other vertebrates. The laboratory includes dissection of sheep brains and hearts, cow eyes and other vertebrates.

#### ***Anatomy 32 (General Human Anatomy, 4units)***

All eleven organ systems of the human body including related histology and pathology are studied. The course is designed for science, health-related, pre-nursing (Bachelor of Science in Nursing), and pre-professional majors.

***Biology 10 (Fundamentals of Biology, 4 units)***

This course discusses the basic principles of structure, function, and relationships of living organisms with special reference to humans.

***Biology 15 (Environmental Aspects of Biology, 3units)***

Ecological and biological principles, concepts, problems and solutions are evaluated at local and international levels.

***Biology 17 (Marine Biology, 3 units)***

This is an introductory marine biology lecture course that reviews the history of marine biology and discusses local species of marine plants and animals and major marine communities.

***Microbiology 33 (General Microbiology, 5 units)***

This course is a study of microbial anatomy and physiology. It also includes the study of fundamental techniques in the growth, culture, and identification of microorganisms.

***Physiology 31 (Human Physiology, 4 units)***

This course is a study of cellular physiology and the functional aspects of the human organ systems.

All the courses listed on the previous page have had the course outlines reviewed by the College Curriculum Committee at least once in the last six years. The timeline for the review process is shown in Table 10, below, (extracted from ECC Natural Sciences Division Curriculum Committee worksheet). Faculty members from the Life Science attend and actively participate in the Natural Sciences Division Curriculum Committee meetings. The course reviews are done collaboratively, to update the course contents, lecture textbooks, laboratory activities/ manuals, and assessment standards/procedures. The faculty members are current in both content knowledge and pedagogy. We regularly attend and participate in faculty development and training programs, on and off campus.



Table 10: Course Review Cycle for Compton Life Sciences.

Course	Last Course Review	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
		Fal 10	Spr 11	Fal 11	Spr 12	Fal 12	Spr 13	Fal 13	Spr 14	Fal 14	Spr 15	Fal 15	Spr 16
Anat – 30	2003 - 04			P	P					X			
Anat – 32	2003 - 04											X	
Biol - 10	2009 - 10												X
Biol - 17	2007 - 08							X					
Micro – 33	2008 - 09									X			
Phyo -31	2009 - 10							X					

Legend: P – In the year of next program review, X - Semester for the next program review

### Course Additions

Budget and facility constraints have restricted any increase in the number of our program course offerings. It is hoped that when funding improves, we will be able to offer courses like Human Genetics and Principles of Biology for majors.

## **Degree courses**

All courses from our program that are required for an Associate in Science degree in Life Science have been offered in the last two years. However, the number of course sections declined from fall 2009 to fall 2010, while the fill rates increased by more than 10% (Institutional research data).

## **Articulation**

All the courses offered in the Life Science, discussed earlier, are UC and CSU transfer courses as advertised in the El Camino College, Compton Center 2010-2011 catalog.

## **Degrees, Certificates, and Licensure Exams**

The Life Science program provides courses (Anatomy & Physiology, Anatomy, Biology, Microbiology, and Physiology) that prepare students for admission into Nursing / Allied Health disciplines. Many students also take our courses like General Biology and Marine Biology to satisfy their general education requirements. Students who have completed courses offered in the Life Science have graduated functioning as Registered Nurses, Nursing Practitioners, Radiology Technicians, and Physician Assistants. Several students also have transferred to four-year universities to complete studies for undergraduate programs in various disciplines.

## **Related Recommendations**

It is recommended that for improved retention and success rates, the program should strive towards smaller class sizes and more course sections for better interaction between students and professors. Our labs were built for a maximum of 28 seats but the class limit has risen to 36. It is our belief that a smaller class size would be more effectively managed by the professor and will translate into a higher success rate than what we have now. The relatively lower success rates in an anatomy and physiology may be improved by offering a combination of Anatomy and Physiology (34A and 34B). This course is UC and CSU transferrable and it is available at the ECC, Torrance, and other colleges like the Riverside Community College, Riverside, and Mount San Antonio Community College, Walnut. This will give students an alternative route towards completing their courses. Also, it's hoped that Biology 15 can eventually be offered along with Biology 17. Currently, there are no available hybrid/online courses in the program. The program's future plan is to start one or two sections of hybrid/online Life Science classes that

may enhance the course offerings. Finally, the Life Science program should continue to invest in faculty/staff development programs, technology and laboratory materials in order to provide the best quality of instruction and achieve the highest level of student success.

## **STUDENT LEARNING OUTCOMES (SLOs)**

### **Program Level SLOs**

Below are the different program SLO statements that are assessed semester to semester and the representative assessment types are numbered:

Students will be able to use language appropriate to life sciences.

The student will master the use of appropriate biological tools and evaluate evidence gathered to explain biological principles.

Students will be able to apply concepts learned to healthy and pathological outcomes.

Students will have a working knowledge of biological principles and a mastery of a broad set of factual biological knowledge concerning ecology, evolution and cells.

1. Student will be able to use the compound microscope to observe cells, tissues, or microorganisms.
2. The student will understand and apply principles of the scientific method; recognizing an idea based on reproducible evidence.

### **Course Level SLOs**

Below are the different course SLO statements that are assessed semester to semester and the representative assessment types are numbered:

#### ***Anatomy 30 SLO Statements***

Students will be able to identify higher vertebrate body structures, and explain functions of all body systems.

Students will be able to use language appropriate to anatomy and physiology and the health sciences.

Students will demonstrate the use of instruments for dissection, histology, and to gather data.

1. Students will demonstrate proper microscope techniques to view and identify cells and tissues that compose the body organs, and explain the characteristics of the cell and tissue type that make them suited to organ function.
2. The student will be able to differentiate between various types of white blood cells and identify the type of infection given in a clinical case study.

### ***Anatomy 32 SLOs Statements***

Students will be able to identify higher vertebrate body structures, and explain functions of all body systems.

Students will be able to use language appropriate to anatomy and physiology and the health sciences.

Students will demonstrate the use of instruments for dissection, histology, and to gather data.

1. The student will be able to identify bones and muscles at the site on an injury and identify the functions affected by the injury and list the sequence of events in fracture repair.
2. The student will be able to identify muscle groups as flexors or extensors and explain how they move the joint.

### ***Biology 10 SLO statements***

The student will understand and apply principles of the scientific method; recognizing an idea based on reproducible evidence.

The student will be able to use the compound and dissecting microscope to observe cells and microorganisms.

The student will be able to describe key activities at each stage of mitosis.

1. Students will be given a journal article that summarizes key findings from a research study. They will be asked to identify the key components of the scientific process, including the observation leading to the question, the question motivating the inquiry, the hypothesis directing the experiment as well as key experimental design components. They will identify the evidence gathered and the conclusions suggested by the evidence.

Student understanding will be assessed using the rubric developed by the division OR Students will be given a description of a laboratory situation, with some observations of results. Students will be asked to design an experiment, describe the procedural details, predict the data collected and write an explanation of the results.

2. A: Students will make wet mount slides of onion epidermis and cheek cells and observing them under low and high power with compound microscope. B: Students will use the dissecting microscope to observe a macroscopic plant or animal specimen.

### ***Biology 15 SLO statement***

The student will understand and apply principles of the scientific method; recognizing an idea based on reproducible evidence.

Students will use basic energy principles to explain the flow of energy in living systems, such as those that occur in the cellular metabolic pathways of photosynthesis and cell respiration, or the relationships observed between autotrophs and heterotrophs in ecosystems.

Students can use the principles of conservation of matter to describe how biologically significant atoms and molecules move between the biotic and abiotic components of an ecosystem and the role living things play in the cycling of these nutrients.

1. Students will be given a journal article that summarizes key findings from a research study. They will be asked to identify the key components of the scientific process, including the observation leading to the question, the question motivating the inquiry, the hypothesis directing the experiment as well as important experimental design components. They will identify the evidence gathered and the conclusions suggested by the evidence. Student understanding will be assessed using the rubric developed by the division.

### ***Biology 17 SLO statements***

The student will understand and apply principles of the scientific method; recognizing an idea based on reproducible evidence.

Students will use basic energy principles to explain the flow of energy in living systems, such as those that occur in the cellular metabolic pathways of photosynthesis and cell respiration, or the relationships observed between autotrophs and heterotrophs in ecosystems.

Students can use the principles of conservation of matter to describe how biologically significant atoms and molecules move between the biotic and abiotic components of an ecosystem and the role living things play in the cycling of these nutrients.

1. Students will be given a journal article that summarizes key findings from a research study. They will be asked to identify the key components of the scientific process, including the observation leading to the question, the question motivating the inquiry, the hypothesis directing the experiment as well as important experimental design components. They will identify the evidence gathered and the conclusions suggested by the evidence. Student understanding will be assessed using the rubric developed by the division.
2. Students will be given the opportunity to explain the processes of each stage of mitosis in a written or verbal format.

### ***Microbiology 33 SLO statements***

Student will be able to identify microbes and explain their roles in health and disease.

Students will be able to use language appropriate to microbiological studies and the health sciences.

The student can identify types of white blood cells, indicate normal values and analyze abnormal changes of white blood cells for diagnosis of disease or allergic reactions.

1. Students will be given data from a patient's differential white blood cell count. The student will compare the patient's differential white blood count to normal values and determine if any abnormalities exist. The student should be able to determine the reason or cause for any abnormal white blood cell count (i.e. type of infections, infectious disease or allergic reactions). The student should be able to conclude why a specific type of white blood cell increased or decreased. This analysis should take into consideration the functions of white blood cells.
2. Students will demonstrate proper microscope techniques to view and identify microorganisms.

### ***Physiology 31 SLO Statements***

Students will demonstrate how the different body systems interact to maintain water balance. Students will be able to apply concepts learned to healthy and pathological outcomes.

Students will be able to use language appropriate to physiological functions and the health sciences.

Students will be able to describe mechanisms and explain physiological processes that occur in the human body on cellular, organ, systemic, and organism levels.

Students will demonstrate the use of instruments to gather physiological data, then analyze the data.

1. The student will be able to differentiate between various types of white blood cells and identify the type of infection given in a clinical case study.
2. Students will construct a concept map to illustrate how the urinary, endocrine, cardiovascular, respiratory, nervous, muscular, integumentary, lymphatic, and digestive systems interact with each other to maintain water balance in the body.

The timeline in Table 11 shows the completed and upcoming assessment schedule for our stated program and course level student learning outcomes.

**Table 11: Timeline for SLO Four-year cycle and Program level SLO assessments**

Courses	Sections	Number of SLOs	Assessments Completed	Lead Instructor	Next Assessment Cycle
Program LO	24	8	6/02/2010	Osanyinpeju	Spring 2014
Anatomy-30	4	3	3/16/2010	Walker	Spring 2014
Anatomy-32	7	4	10/10/2007	Osanyinpeju	Fall 2011
Biology-10	4	2	Spring 2010	Priest	Spring 2014
Biology-15*	X	1	Spring 2011	Walker	Spring 2015
Biology-17	1	1	Fall 2011	Priest	Fall 2015
Microbiol 33	4	2	Fall 2010	Wallano	Fall 2014
Physiol 31	4	2	Fall 2010	Boatwright	Spring/Fall 2011

Note: Course (Sections) listing based on offerings Fall 2011. \*Course not offered this Fall 2011

## **Assessment Results and Recommended Changes**

SLO assessments completed in Life Sciences gave valuable information which is helping faculty to:

1. Understand how to better facilitate student learning.
2. Determine what's working and what's not working in their courses or program.
3. Select the appropriate teaching strategy.
4. Prioritize the need for equipment and technology to improve instructions.
5. Help students to explain what they can do and what they know.

As a result of SLO assessments and reports, the faculty is continuously updating their pedagogy, acquiring new strategies, and improving student/professor relationships. On the average, 75% of our students succeed in the individual SLO assessments conducted but our overall success rate is less than 75%. It is common knowledge that many of our students become overwhelmed and frustrated by mid-semester because of the amount of material that has to be covered in each of our courses. We strongly believe that inadequate student preparation and taking too many classes in a semester contributes to their lack of success.

The plan is to spend more time on each topic covered in and out of the classroom to reinforce the lessons and activities. Thus, we need tutoring, supplemental instruction, and open labs in the program. Proper student program planning by the Counseling Program will ensure students take classes that teach reading and study skills before enrolling in Life Science classes. We also have requested more microscopes, quality histology slides, anatomical models and Biopac equipment for Physiology, and clickers. We are expecting four more Biopac sets, histology slides, models, projection microscopes for instructors and student microscopes with pointers.

## **Program's Level of SLO Assessment/ Implementation**

Currently we are at Proficiency level, but our goal is to be at Sustainable level by the end of Fall 2012. We endeavor every semester to assess different SLO statements and apply our findings to our teaching methodology in subsequent semesters. We decided, for example, based on the Scientific Method SLO statement assessment, that we will involve our students more in the scientific process. Our students are now immersed in different activities that will emphasize all aspects of the scientific process. More importantly, students are asked to propose hypotheses, design experiments or perform investigations, and analyze the data they collect.



## **Related Recommendations**

1. Reserving MS 105 for supplemental Instructions, tutoring and faculty driven review sessions to provide students the necessary guidance and help they need to succeed.
2. In any future expansion plans, we should have separate lecture rooms/halls and labs.
3. The lecture room should accommodate double the number of students in one lab - to allow for efficient use of space and faculty resources.
4. Funds for professional training/conferences, and other college sponsored Faculty interactions should be provided.

## **FACILITIES, EQUIPMENT, AND TECHNOLOGY**

### **Adequacy and Currency of Facilities, Equipment, and Technology**

Currently, the program has first rights/refusal on MS 103, 105, 107, 108, 128 and 110. These laboratory spaces are deficient in number of electrical outlets, internet ports and appropriate ventilation (temperature control and chemical ventilation) for instruction. Further, the instruction rooms have no Wi-Fi or usable student internet access making computer enhanced learning inefficient or non-existent. The rooms have a mismatch of chairs and seating arrangements that are not appropriate for a laboratory setting. The floors have electrical outlets with only plastic covers and the floors are cut up in a way that some areas are not safe to walk.

Each of the instructional spaces requires the faculty member to bring their own laptop (college provided) and cabling (not provided) to utilize the available smart features of each room. Each instructional space has the benefit of a mounted LCD projector, speakers, DVD and VCR machine. The hub for connection has exposed wires and is not safe as the box connecting all the AV equipment is movable yet tethered...the wear and tear on the equipment is horrific. Further, the internet access is not connected to the master hub so wires are criss-crossing everywhere.

The program also has two very large prep-areas (MS 109 and 106) which are woefully ill-conceived and configured. MS 109 has no gas line or air lines—which makes this dedicated microbiology prep-area inadequate for the sheer volume of media that must be prepared by our lab technician each week. MS 107 has ample storage but is configured in such a way that useful constructive work is next to impossible. All of the laboratory areas with the exception of MS 107 have no functioning gas/air lines.

The program has a large green house located on the southwestern side of the Math/Science building. This is the exact wrong location for this structure. Further, this green house has no shade covers, water lines or active swamp coolers to mediate the heat and sunlight, due to poor positioning of the structure. This creates, in essence, a non-functional green house. The green house also has no locking storage and the locks on the outside of the building have been broken off or damaged.

As the program continues to see industry (nursing, biotechnology, general sciences) and student (IGETC requirements, major requirements) demand for biology courses increases, these facilities will not meet the demand...as they currently do not meet demand.

### **Immediate (1-2years) Needs**

In the nearest future, as economic hardship straps the state and the education system in California, the current instructional facilities and prep-areas will be insufficient to meet course demand. However, the immediate need of the facilities is to have significant upgrades to Wi-Fi & internet access, gas and water line capabilities, appropriate seating and configuration and improvements to climate control. The program would like to continue on the technology front with at least 4 more laptop computers for the 4 Biopac systems to accommodate the growing demands for nursing related courses.

Further we need to get MS 103 to accommodate 75 students – with 75 dedicated desks. This would allow for increased utilization of the laboratory rooms and remove lecture from being taught in the laboratory setting. This would open up the laboratory rooms for more laboratory sections and fewer students per section would be great for one on one and hands- on activities.

The program requires a COW of laptop computers (n=40) with Wi-Fi capabilities. This is essential for the use of technology and smart learning programs that are ever increasing with all the courses taught in the program. This would enhance student success as we incorporate different approaches and activities to learn the materials. With this COW of laptop computers, the program would need a portable (internet capable) printer for student use—for a small print fee.

### **Long Range (2-4 years) Needs**

The program should continue to grow based on industry and educational needs of our students. Under the assumption that the economy of the state should improve, at least minimally, and the

fact that the health care industry is projecting a shortage of qualified personnel over the next 10 years, the program can anticipate no reduction in the demand for courses related to the health care industry.

The program needs more high-quality/smart facilities in both the lecture and lab settings. Ideally, the current facilities would be retro-fitted to be exclusively large lecture setting (with truly smart room capabilities) and a new building be constructed with proper laboratory functionality and built in growth potential. This new building would be adjacent to the existing accommodations to facilitate the movement of students from lecture to lab.

### **Related Recommendations**

The purchase or acquisition of the following will go a long way to enhance our teaching and student learning:

1. Projection microscopes, microscopes with pointers and good quality human histology slide sets.
2. More anatomical models
3. Spectrophotometers and cuvettes
4. Gel electrophoresis kits
5. Hands on lab manual assessment for non-majors.
6. Marine biology laboratory section and the materials to make it grow.
7. Item analysis scantron forms
8. Retro-fitting of existing classrooms for gas/air
9. Repair of those issues in each room that pose a potential injury to students, faculty or staff. There are temporary fixes in place now but these could fail any time.
10. Retro-fitting of existing classrooms for proper ventilation and climate control
11. Retro-fitting of classrooms for electrical and internet access by faculty and students
12. 1-2 COW laptop systems for use in all courses
13. New dedicated laboratory building – built beyond current needs...with growth in mind
14. New chairs for all laboratory settings that can take the punishment of all day use
15. Retro-fitting of the greenhouse with appropriate materials, electrical and gas for use and growth of a variety of different species of botanicals

## **STAFFING**

### **Current Staffing**

The program has six (6) full-time faculty members and seven (7) part-time faculty members. Two of the full-time faculty members were hired within the last 2 years. All members of the program have advanced degrees.

The program has 2 full-time laboratory technicians; however, one has been on extended medical leave for over a year. To assist our laboratory technician, we have one student worker/-hourly student.

The program currently has one (1) dedicated biology tutors/Supplemental Instruction (SI) leaders. This individual assists students directly based on faculty specific experience.

### **Program's immediate and long-range staffing needs**

Due to the FTES generated by the program, in the foreseeable future we would need one additional full-time faculty member and one full-time laboratory technician to cover the evening classes. Additional staff and faculty should be dependent on the FTES generated by the program.

Immediately, the program needs a full-time laboratory technician to assist the current laboratory technician. As FTES generates more sections of biology courses, the addition of more laboratory technicians with higher and more industry related skills will be necessary.

The program currently has one student worker who assists the laboratory technician (primarily) and the faculty for 20 hours a week. The program needs a budget allocation of 40 hours of student worker monies. These hours could be split amongst many students. The program could use someone to man a "go-to" office/table and help with everyday tasks like coordinating meetings, mail and student/faculty exchanges. The lack of a consistent "go-to" office for the Division leaves students very frustrated at getting their needs met.

### **Related Recommendations**

Addition of full-time faculty, staff, and student workers based on increasing FTES  
Increased numbers of tutor/SI leaders who can work at all hours of the day and night.

## **DIRECTION AND VISION**

The Strategic Initiatives (SI) of the El Camino College continues to be our guide as we look into the future. Our main focus is better instruction and student support for improved student retention and success. The faculty pledges to continue to improve ourselves through student and faculty assessment, training, and planning. We will remain committed to our relationship with the Compton and Torrance faculty, administration, and community to improve society through technology and sustainability practices.

Advances in biotechnology, needs in the health care industry and the federal science goals require the program to keep pace with industry demands. In order to accomplish this goal, the program requires new laboratory equipment and laboratory spaces. Unfortunately, due to state funding restraints, funding is not commensurate with the growth we have been experiencing. The lack of expanded laboratory space has placed a limit on the number of courses that can be offered and thus the number of students that can be served to meet industry and university demands. The Life Science program budget can no longer simply absorb the cost of buying laboratory materials, which include: dissection specimen, chemicals, latest/ modern equipment, and equipment maintenance and consumables. We hope that the Life Science budget will be increased significantly since the program generates a relatively higher FTES than many other programs.

The Life Science program proposes to introduce the following courses to provide students with a robust and complete set of offerings: Anatomy and Physiology I and II, Principles of Biology, brand new courses like Molecular Biology, Human Genetics, and hybrid courses in General Biology, Human Anatomy and Human Physiology. These offerings and continued modernization of the program will provide students and industry the much needed support and workforce for the coming years and decades. We very strongly believe that the Life Science Program will continue to grow. The faculty is young, dynamic, knowledgeable, and able to provide the services of educating the future professionals and citizens of our society.

### PRIORITIZED RECOMMENDATIONS

Categories	Items	Costs	Positions
Facilities	Repair of electrical, gas, and plumbing issues each room	\$25,000	1
Technology	Retro-fitting of existing classrooms for internet access by both faculty and students	\$20,000	1
Miscellaneous	Microscope repair, parts and service	\$4,200/yr	3
Lab equipment and materials	Rats, cats, fetal pigs, brain, eyes, hearts, and consumables	\$10,000	4
Facilities	Large lecture rooms/ halls	\$20,000	4
Miscellaneous	Autoclave repair and service contract	\$7,200	6
Faculty and staff	Conferences and other college sponsored Faculty interactions	10,000/yr	6
Facilities	Retro-fitting of existing classrooms for proper ventilation and climate control	\$110,000	8
Miscellaneous	Waste disposal (rats, cats, fetal pigs, brain, eyes, hearts)	\$2,500/yr	9
Student support	Open Life Science labs	\$20,000	10
Facilities	Rooms for Supplemental Instructions, Tutoring and faculty driven review sessions	\$20,000	11
Facilities	New chairs for all laboratory settings (108@ \$126)	\$13,608	11
Lab equipment and materials	Projection and student microscopes	\$5,352 and \$36,410	11
Facilities	New dedicated laboratory building or old structure converted	\$40,000 or \$20,000	14
Lab equipment and materials	Good quality human histology slide sets (40 each)	\$3,642	15
Lab equipment and	Advanced Digital Microscope (1) and 3MP	\$4,350 and	16

materials	Camera (1)	\$2,175	
Lab equipment and materials	More anatomical models	\$7,750	17
Lab equipment and materials	Digital spectrophotometers and cuvettes (5)	\$7,750	18
Lab equipment and materials	Gel electrophoresis kits	\$300	18
New Course Offering	Anatomy and Physiology (34A and 34B), Biotechnology, Molecular Biology, Biology 15, Biology 17 lab, hybrid/online courses	\$150,000	20
Faculty and staff	2 full-time faculty, 1 lab staff, 4 tutor/SI leaders, and 2 student workers	\$200,000	20
Student support	Smaller class sizes	\$50,000	22
Lab equipment and materials	Biopac set and 1 laptops	\$5,000	23
Technology	1-2 COW laptop systems for use in all courses	\$21,960 (HP) \$19,960 (Dell)	23
Student support	Recruit male minority students.	\$20,000	23
Lab equipment and materials	Hot plates/ stirrers (8)	\$2,288	26
Student support	More course sections	\$50,000	27
Miscellaneous	Item analysis scantron form	\$100	27
Miscellaneous	Periodic Table of Elements with Spring Roller (4)	\$460	29
Facilities	Retro-fitting of the greenhouse with appropriate materials, electrical and gas	\$50,000	30