Life Sciences Program Review
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I. Overview

A. Description of Program

Mission 1: to meet the educational needs of our diverse community – AA degrees, transfer to university, mastery of basic skills, cultural enrichment/lifelong learning, career education, & development of economy & jobs.
Mission 2: ensure student success by offering quality comprehensive educational opportunities – maintain optimal academic standards, ensure availability of academic & student support services, provide technology, infrastructure, facilities to support teaching and learning, foster positive campus climate, create educational, business, community partnerships, follow progressive prudent fiscal policies, support professional development for faculty

The Life Science program includes courses in anatomy, biology, botany, microbiology, physiology, and zoology that meet the educational needs of our diverse community. These courses provide a comprehensive lower division curriculum for science majors preparing to transfer to 4-year universities. They allow a student to pursue an A.S. degree in Biology, General Science, Laboratory Technician (Medical), Pre-Dentistry, Pre-Medicine, Pre-Nursing, Pre-Optometry, or Pre-Pharmacy. General education courses are designed to allow students to understand and apply the scientific method, and to understand basic underlying principles of nature and the relevance to their lives. Field courses may be required for career education and also serve as opportunities for lifelong learning. The Allied Health program includes courses in anatomy, physiology, and microbiology that are required for students entering the fast-growing health care fields.
Our excellent faculty is well-qualified to teach the courses in the Life Science program, and they maintain rigorous academic standards in their classes. Academic support for students is in the form of open labs and tutoring. The life science classrooms have recently been renovated and provide computer technology and internet access and modernized lab facilities. The faculty and students of the Life Science program are involved in campus-wide activities, such as the Onizuka Science Day, which foster a positive campus climate and outreach to the community.
The Division also supports the ScienceFEST, a program designed to assist future elementary school teachers relate what they are learning in their science classes to the science they will be teaching to their students.

B. Status of Previous Recommendations

The faculty was asked to explore the issue of prerequisites for entry-level Life Sciences courses. The evidence obtained from research could be used to validate “hard” prerequisites in basic skills for courses currently carrying advisory prerequisites. In the subsequent years, progress has been made. For example, the Biology 1A course instituted the hard prerequisite of Chem 4 in place of the recommended preparation of Chem 4. All the Life Science courses have the recommended preparation stated that the student be able to read and write at the college level. None of the courses have instituted an English prerequisite, though. This is because the department members have not done the research that is required to establish the validity of an English prerequisite. Fear of the negative effect on the enrollment that such a prerequisite would have is the probable reason why this research has not been initiated. It was also recommended that steps should be taken to improve the marketing of the field classes. In recent years, the field biology instructor, Ms. Bellemin, has done an admirable job in publicizing her classes by campus fliers and any other possible means. Enrollment continues to be low in the field classes, and so more work needs to be done in publicizing the classes and informing counselors and potential students that the general education credit that these courses offer is the same as the non-field classes. The faculty

was instructed to develop a long-term plan for the upgrading of facilities. This was accomplished in 2002 with the acceptance of our application to the state building fund. They funded the renovation of the existing science facilities. This was completed in 2005, and the life science classrooms are modernized with computer technology, internet access, and safety features. Acquisition of new furniture and additional equipment was made possible by funds from a voter-approved local facilities bond. As recommended by the previous program review, sources of funding such as grants are being pursued. For example, the Department of Defense grant was applied for in 2006, which will supply $150,000 for new equipment and technology. Finally, it was recommended that faculty and administration communicate more effectively to achieve a consensus on the goals of the program and the means to attain them. Good progress has been made since Ms. Barbara Perez was named the Dean of the Division of Natural Sciences. Under her leadership, committees were formed, goals were established, and objectives were written.

II. Program Statistics

A. Demand: FTES by Course/Program

Instructions: Analyze the **FTES by Course/Program** using 1st census data and answer the following questions. At a minimum, your analysis must include a 3-year cycle comparing like semesters.

Course	Year 1 (Fall, 2004)	Year 2 (Fall, 2005)	Year 3 (Fall, 2006)
Biology 8	7.05	6.58	8.28
Biology 10	80.76	84.12	92.19
Biology 11*	7.01	6.80	
Biology 1A	48.11	39.51	39.19
Biology 1B	11.79	12.43	12.43
Biology 12	4.04	3.75	6.06
Biology 15	6.90	4.46	4.57
Biology 17	7.54	3.93	6.05
Biology 18	1.81	1.38	1.70
Anatomy 30	43.58	45.32	43.58
Anatomy 32	105.31	103.48	101.17
Microbiology 33	37.92	47.79	43.65
Physiology 31	31.46	45.60	48.20
Total for Life Sciences	**393.29**	**405.48**	**407.08**
***** Data for Biology 11 taken from Spring semesters of 2004 and 2005			

1. Given the data, can you recognize any trends in course demand in any of the Program's courses?
   The course demand for Biology 10 and Physiology 31 continues to increase with each year. The demand for the anatomy courses has reached the maximum possible for our faculty and facility.

2. What are you doing to respond to trends?
The division is constantly requesting the hire of additional faculty to teach these courses, and looking at creative schedules to best utilize the limited laboratory classrooms to teach in.

3. Should a recommendation be written addressing the data? _X__ Yes ____ No
(If yes, list.)
1) The administration should budget for the hire of at least one full-time anatomy instructor, and at least one full-time general biology instructor.
2) The administration should budget for the conversion of other classrooms within the Natural Science building complex into laboratory classrooms.

B. Offerings: Fill Rate*

Instructions: Review and analyze the **fill rate data** (including the fill rate per course for both day and evening), provided by Institutional Research for this program for a three year cycle and answer the following questions:

Average fill rate of courses in program: How does this program compare to:

	Year 1 (Fall, 2004)	Year 2 (Fall, 2005)	Year 3 (Fall, 2006)
Day classes			
Anatomy	110	111	107
Biology	92	88	87
Microbiology	108	105	94
Physiology	99	115	116
Evening classes			
Anatomy	110	108	107
Biology	123	110	88
Microbiology	108	111	109
Physiology	106	104	114
Overall Department	**101**	**99**	**96**

1. Given the data, is the program in a growth mode? _____ Yes __X__ No
Comment.
The annual seat count for the program has been in decline from 1,644 in 2003-04, to 1,596 in 2004-05, to 1,512 in 2005-06, with a 3-year average of 1,584. The Fall, 2006 Actual Seat Count was 1,578, with a fill rate of 96% for total Life Science courses. The course fill rates for daytime classes have declined from 98% in Fall ’03, to 93% in Fall, ’04, to 88.3% in Fall ’05, and the fill rates for evening classes have declined from 108.6% in Fall, ’03, 98.6% in Fall, ’04, to 88% in Fall, ’05. In the above table, average fill rate of courses in the program are compared for 3 semesters, Fall, ’04, Fall ’05, and Fall, ’06. Numbers greater than 100% reflect the willingness of the instructors to allow more students to enroll than the maximum number of seats. This, in turn, is a reflection of the number of students that desire these

courses combined with the lack of course sections that are offered. The decline in the fill rate of the biology courses could reflect the offering of courses that have limited student demand. These courses continue to be offered in an effort to maintain the diversity of the program's general education biology course offerings. Overall, the program is not in a growth mode because of the preponderance of students desiring the Allied Health Science courses, Anatomy, Physiology, and Microbiology, and the lack of classroom space and instructors to accommodate the demand.

2. What adjustments are indicated?
   Explain.

   The consistent fill rate of over 100% for the health science courses, Anatomy, Physiology, and Microbiology, is an adjustment made by the faculty to minimize student inconvenience caused by high student demand for the courses and restricted number of course sections offered. Increased section offerings of these courses are done when facilities and instructors are available.

3. Should a recommendation be written that addresses the data? __X_ Yes ____ No
   (If yes, list.)
   See Section A recommendations.

* Percent of fill of each class at census.

C. Scheduling: Student Satisfaction with Scheduling

Instructions: Complete the chart below. Indicate the time when sections of courses in the program are currently scheduled to start. Analyze the data provided by Institutional Research on student satisfaction with scheduling in the program and answer the questions.

Course	During the early morning before 10 am	During the late am/early pm 10am –1:55 pm	During the late afternoon 2 pm -4:25 pm	During the evening 4:30 & later	During the weekend	During the summer	During the Winter (07)	Via Online
Anatomy 30	1	1		2		2		
Anatomy 32	3	2	1	2	1	2		
Biology 8	1							
Biology 10	5	3	1	3	1	6	1	
Biology 1A	2	1		1				
Biology 1B	1							
Biology 12			1					
Biology 15	1			1				
Biology 17	2							
Biology 18			1					
Micro 33	1	2		1		2		
Physio 31	1	1	1	1		2		

1. What (if anything) is indicated by the student satisfaction with scheduling?
   Students seem to be satisfied with the scheduling of classes in the morning and early afternoon. They appear to be less satisfied with the scheduling of classes in the evening and on weekends.

2. Are there time periods of high student demand which are not being addressed? _X_ Yes __ No
   How could such demand be addressed?
   Additional sections of Biology 10, Anatomy 32, Microbiology 33, and Physiology 31 could be offered in the evening. Sections of Micro 33 and/or Physio 31 could be offered during the weekend. An online Anatomy 30 class is under development and is expected to be offered in spring 2008.

3. Should a recommendation be written addressing this area? __X__ Yes _____ No
   (If yes, list.)
   See Section A recommendations.
   1) Additional classified staff should be hired to provide support services to the additional sections that need to be added in the evening and on weekends.

D. Retention and Success

1. Retention

Instructions: Review and analyze the data on **retention (course completion with a grade other than W)** over a three-year cycle comparing day to evening classes, term to term (e.g. fall to spring, spring to summer, etc.), and course levels.

1. Given the data, what trends are observed?
   Comment.

Data is not available for day vs. evening classes, or for spring classes, but trends can be observed at the course level from fall term to fall term over a three-year cycle of 2003 to 2005, and comparisons can be made between course levels in some cases.

The Biology program's retention has shown a steady increase over the period from 2003 to 2005, from 72% in the fall semester of 2003, to 76% in the fall semester of 2005. This compares favorably to the California State average retention for biology which has remained the same, at 81%, during the same period.

The Biology 10 course has the highest enrollment of the general biology courses, and over the three year period of 2003 to 2005 showed a steady increase in course retention, from 68.3% in the fall semester of 2003 to 77.8% in the fall semester of 2005. This is a reflection of the refinement of the course by the full-time faculty and the lab technicians. On the other hand, the Biology 15 course, which is a lecture-only general education course, not only showed a dramatic decline in enrollment in 2005, from an average of 67 students to 41, but also a similar decline in retention, from an average of 83.5% to 65.85% in the fall semester of 2005. Both of these data are due to the reduction in class sections offered starting in 2005. The Biology 17 course also shows a decline in retention from 78.8% in 2003 to 73% in both 2004 and 2005. But the enrollment drop in the fall semester of 2005 reflects the reduction of class sections offered, so the apparent trend may not represent an actual decline. The other general biology courses did not show an increasing or decreasing trend in course retention over this three-year period.

It was possible to compare the retention of three general education courses with a consistent enrollment over the three-year period of 2003 to 2005, Biology 10, Biology 11, and Biology 8, with the

biology major courses, Biology 1A & 1B. The non-major courses showed a smaller retention than the major courses when averaged over the three year period. The average retention of the Biology 10 courses was 73%, the Biology 11 was 53%, and the Biology 8 was 73.3%. The average retention of the Biology 1A courses was 78%, and the Biology 1B was 84.5%. This comparison is not a surprise in that the students enrolled in the biology major courses have completed chemistry and math prerequisites and so are better prepared to take the course. Furthermore, the interest in and positive outlook toward the subject of biology is usually more common among the biology major students.

The retention rate for the Biology 1A course, which fluctuated between 75% to 80% in the three-year period of 2003 to 2005, is often the result of students that prefer to drop the course with a W rather than receive a grade of C. These students, who often aspire to professional schools like medical or pharmacy schools, are loath to have their GPAs adversely affected by a five-unit grade of C. However, when compared to retention data from the period of 1987 to 1991, the current program shows significant progress. The department offered more sections of Biology 1A during the period of 1987 to 1991, but the course did not have a Chemistry prerequisite and its retention averaged 45%. With the current program, less sections of Biology 1A are offered and the course has a Chemistry 4 prerequisite. The current retention rate validates the determination that students with a chemistry background will be more successful in the Biology 1A course.

Retention rates in the Allied Health Science classes Anatomy 30/Anatomy 32, Physiology 31, and Microbiology are as follows 60%, 79%, 78%. Relatively low retention rates in Anatomy 30 and 32 reflect the fact that these courses are entry level courses with few, if any pre-requisites, and the students are often under prepared for the rigorous nature of the classes. Better student preparation via completion of prerequisites leads to higher retention rates in the Physiology and Microbiology classes.

Retention in the courses of the Biology program as a whole showed steady increase over the period of 2003 to 2005, from 72% in Fall, 2003 to 75% in Fall, 2004, to 76% in Fall, 2005, yet was consistently less than the retention rate of the college as a whole. A possible reason could be the technical and mathematical nature of science courses which make them comparatively more difficult to master. Another reason could be the absence of Credit/No Credit courses in the Biology program and the Natural Science division, compared to the multitude of such courses in other programs of the College.

2. Should a recommendation be written addressing the data? _____ Yes __X__ No
(If yes, list.)

2. Success Rate

Instructions: Review and analyze the data on **success rate (students who earned a grade of A,B,C, or Credit)** over a three-year cycle comparing day to evening classes, term to term (e.g. fall to spring, spring to summer, etc.), and course levels and answer the following questions:

1. What trends are observed?

Data is not available for day vs. evening classes or for spring and summer classes, but trends can be observed at the course level from fall term to fall term over a three-year cycle from 2003 to 2005, and comparisons can be made between course levels in some cases.

The Biology program's success rate has shown a steady increase, from 59% in the fall semester of 2003 to 61% in the fall semester of 2005. This compares favorably to the California State average for biology which has declined slightly from 65% in 2003 to 63% in 2005. The Allied Health Science

program's success rate has shown a gradual increase. This is particularly noted in physiology and microbiology.

In general, students that complete their biology class at ECC do so successfully. Over the period from 2003 to 2005, the average success rate for students completing their biology course was 81.5%. The striking discrepancy between success rates of students completing the course and that of all students that enroll in those courses is due to the large number of students that drop with a W. This is seen most dramatically in the non-major courses. Over the period from 2003 to 2005, the non-major courses averaged a 27% rate of students that dropped with a W, compared to the Biology 1A and 1B courses which averaged a 20.5% rate. This is a reflection of student preparation before enrolling in biology courses. All biology courses recommend that students be able to read and write at the college level. This is because the biology subject employs a technical vocabulary that the student must master during the course. Students that are remedial in language skills may find comprehension of the textbook and the course information too difficult and drop the course.

2. Should a recommendation be written addressing the data? _____ Yes __X__ No
   (If yes, list.)

III. Curriculum
A. Course and Content

1. Courses Not Offered

Instructions: Indicate the total number of courses in the program and list all courses in the program which are in the catalog but have not been offered in the last three years. Refer to this list to answer the following questions:

There are 19 courses offered in the 2005-2006 Catalog for this program. Field Botany (Biology 14), Special Topics in Biology (Biology 50), and Cooperative Career Education (Biology 96abcd) have not been offered in the last three years.

1. Given the data, are there courses that should be inactivated? __X__ Yes _____ No
   Comment.
   The Biology 14 course has already been inactivated due to the lack of an available, qualified instructor and sufficient student interest. Eventually, the courses Biology 1A and 1B will be inactivated and replaced by the courses Biology 101 and 102.

2. If there are courses not offered in the last three years that you do not wish to inactivate, what reasons are there to keep them active?
   The Special Topics in Biology (Biology 50) should remain active because it allows an instructor to offer a seminar-like course on a topic that is significant at that time. An example of this might be a course exploring the science involved with global warming or AIDS or antibiotic resistant disease pathogens.
   The Cooperative Career Education (Biology 96abcd) should remain active because it allows local employers, like the SEA LAB or Cabrillo Marine Aquarium, to offer students not only employment but unit credit for doing science-related jobs.

3. Should a recommendation be written addressing the data? _____ Yes __X__ No
(If yes, list.)

2. Course Revisions and Additions

Instructions: Utilize the Course Review Chart from the Curriculum Office to answer the following:

1. Are there course outlines that should be revised? __X__ Yes _____No
(If yes, list.)
The Biology 8 and Biology 11 courses will be reviewed during the '06-'07 school year.

2. Are there courses inconsistent with current practice in the field? ___ Yes _X_ No
Explain.

3. Should new courses to be added to the program? __X__ Yes _____ No
Explain.
The life science instructors feel that the following courses should be added: a lower division genetics course that would satisfy the 4th quarter component of the UCLA biology sequence, a field botany course (currently inactivated), a two-semester combined Anatomy & Physiology course, a pathophysiology course to be taught by the Allied Health Sciences program faculty separate from that of the nursing program, a forensics class and an 8 week Food Microbiology course.

4. Are adjustments necessary to the conditions of enrollment (Prerequisite, Corequisite, Recommended Preparation, and Enrollment Limitations) for a specific course to increase student success?
____ Yes ____ No __X__ Uncertain **Comment.**

All courses in the program have either a prerequisite or recommended preparation regarding the English preparation of the students. Yet, despite this, students enroll in life science classes unable to read and/or write at the college level. These skills are critical to the success of the student in the life science courses, but the department members need to work with Instructional Research to examine whether or not students' English placement actually determines their success in their Biology classes.

5. If the program offers a degree and/or certificate, list them and indicate when the requirements were last reviewed? **(If not applicable, skip to Question 7.)**
An A.S. degree is offered in Biology, General Science, Laboratory Technician (Medical), Pre-Dentistry, Pre-Medicine, Pre-Nursing, Pre-Optometry, or Pre-Pharmacy. The requirements for the degree in General Science and Laboratory Technician are being reviewed during the '06-'07 school year.

6. Are these degree and/or certificate requirements inconsistent with current practice? ___ Yes _X_ No
   Explain.
7. Is there a need to create or delete a degree and/or certificate? ____ Yes __X_ No
   Explain.

8. Should any recommendations be written that address the above responses? __X__ Yes ___ No
   (If yes, list.)

The necessary research should be done by faculty members who feel that an English prerequisite for a specific course would increase student success in that course.

B. Articulation

Instructions: Articulation is the process by which courses taken at ECC can be used to satisfy subject matter requirements at another college or university. This is important in the transfer process for students. To help you in this area, you can review articulation agreements at www.assist.org, the California Articulation Number Guide or meet with the Articulation Officer, Lori Suekawa (ext. 3517).

1. Are there any courses in your curriculum which are part of a lower division preparation for the major that are not articulated with our major transfer institutions?
   No

2. What problems, if any, are there in articulating these courses?

The only foreseeable problems lie in the time that the articulation process takes. For example, when the Biology 1A and 1B courses are replaced by the Biology 101 and 102 courses, the course outlines will be sent to the various universities' articulation office which will pass them on to the appropriate academic department which will call for faculty review. Once this is completed, the university articulation office is contacted, and the articulation agreement is made with our college. This process could take as long as a couple years. In the meantime, students taking the new courses, Biology 101 and 102, might encounter roadblocks to their transfer to the university.

3. Should a recommendation be written addressing above responses? _____ Yes __X__ No
   (If yes, list.)

C. Instruction and Assessment

1. Learning Methods

1. What learning methods are incorporated inside and outside the classroom in the program to promote student success? **Explain.**

Learning methods such as powerpoint presentations, printed lecture outlines, slides or video presentations, and demonstrations with models or actual animals and plants are found most useful by

students for learning biology, based on a student satisfaction survey. Other methods such as current event articles, guest speakers, animations, and field trips are also incorporated by faculty in the program to promote student success. In the laboratory, the primary learning method is the use of the microscope and the drawings that students make from their microscope examinations. Models, preserved specimens, dissections, and live specimens are also available to assist the student in visualizing and reinforcing concepts. Other technologies, such as gel electrophoresis are used as learning methods in the laboratory.

2. Should a recommendation be written addressing above response? __X__ Yes _____ No
   (If yes, list.)

Priority should be given to lab expenditures that allow a hands-on experience for students in the lab. These expenditures should include equipment and technology needs, and also expendable items that must be replenished each semester.

2. Assessment

1. How do you evaluate the extent to which the learning objectives, skills, and competencies are being met?

   A) Courses – Currently written exams, laboratory practical exams, and written reports are used to evaluate whether learning objectives, skills, and competencies are being met.
   B) Program – The division has developed three basic programs that all areas will contribute to developing student learning outcomes: general education, allied health, and science or pre-professional majors. Currently, a general education student learning outcome and its assessment plan is being field-tested in certain courses.

2. How do you use the results of the above evaluation to improve student learning and the quality of the program?

   In the case of a particular course, the course instructors would address any deficiencies in student learning and the quality of the course and make recommendations to the dean. In the case of the program, discussion among the faculty to develop program-level student learning outcomes will establish fundamental concepts that all students should be expected to master by taking the program's courses. This will allow for a measure of standardization and accountability for the program's faculty which would improve the quality of the program.

3. Should a recommendation be written addressing this area? ___X__ Yes _____ No
   (If yes, list.)

   Develop both student learning outcomes and assessment instruments for the allied health and science major programs.

IV. Program Requirements
A. Instructional Support

1. Identify key instructional support areas used by the program.

Libraries & Programs:

X	Library	X	Special Resource Center		Basic Skills Study Center		Library Orientation
	Music Library		Puente Program	X	Honors Transfer Program		Other (Please list.)
X	Learning Resource Center Media Materials Collection		Assessment/Testing Office	X	Counseling	X	MESA
X	EOP&S/CalWORKS	X	Transfer Center		First Year Experience		
	Learning Communities		Project Success				

Computer Labs & Tutoring:

X	LMTC Computer Commons		SRC High Technology Center		Other Computer Lab: Please list.		Writing Center
	CAI MAC Lab	X	Writing Lab				LRC Tutorial Program
	CAI Windows Lab	X	Math & Science Lab			X	Math Tutoring
	TOP Lab		Keyboarding Center				SRC Tutorial Program
	Hawthorne BTC					X	EOP&S Tutoring
	Inglewood Center						

Faculty Support Services:

X	Graphic Arts	X	Copy Center		Distance Education		Other (Please list.)
	Media Services AV Production	X	Tech Services Help Desk		Teleconferences		
X	Media Services AV Equipment Distribution	X	Support Staff		Webconferences		
X	ECC Vehicles	X	ECC hosted Websites	X	Staff Development		
X	ECC E-mail						

2. Do you have some instructional support needs that are not being met? __X_ Yes ____ No
   Comment.

The library is lacking in the science journals collection and in electronic access to journals. The library also lacks sufficient biology subject books for students to be able to complete research assignments. The Learning Resource Center is limited in biology tutoring. Faculty of the Allied Health Science courses such as anatomy, physiology, and microbiology would like more communication with the Nursing Department regarding articulation of courses.

3. Should a recommendation be written to address your needs? __X_ Yes ____ No
   (If yes, list.)
   1. More library expenditures for science books and journal subscriptions.
   2. More money allocated for tutoring.
   3. Regular meetings with the Nursing Dept. representatives and Allied Health Science faculty.

B. Facilities and Equipment

1. Does the program make effective use of its facilities and equipment? **Explain.**

The program makes very effective use of its facilities and equipment. Every available laboratory room is scheduled continuously throughout the day. Equipment is shared in most cases in order to serve the number of sections of the course using it.

2. Are adequate facilities, equipment and supplies available for the program? ____ Yes __X_ No
   Explain.

   The growth and quality of the program is most impacted by the lack of facilities. No further sections can be offered, and class sizes must be maintained at a number that restricts student access to instructor help.

3. Are the facilities and equipment adequately maintained? _X_ Yes ____ No
   Explain.

   The combined efforts of faculty, classified technicians, janitors, and maintenance personnel adequately maintain the facilities and equipment.

4. Should a recommendation be written addressing the data? __X__ Yes _____ No
   (If yes, list.)

   Eventually, additional laboratory classrooms will have to be constructed to meet the demand for biology courses, and to reach the optimum student/teacher ratio that improves the quality of the program.

C. Staffing

Instructions: Analyze the data on **FTEF, adjunct FTEF, and the FT/PT ratio** for the most recent fall semester and answer the following questions:

FTEF (full-time equivalent faculty): # __18.148__

Number of full-time FTEF: #___12____ **Number of adjunct FTEF**: # ___6.128__

FT/PT load ratio: __2:1___

1. How do the program numbers compare to a like semester (Fall to Fall) three years ago or the previous program review?
   In the fall 1989 semester, the FTEF was 18.29, almost identical to 2006. More recently, in the fall 2004 semester, the FTEF was 16.865, and in the fall 2005 semester the FTEF was 17.598.

2. What do the program data indicate? Comment on any trends or unusual data.
   The data indicates that the program went through a decline in full time staff in the last decade, but the current trend indicates a steady increase in the full time staff back to the level reached 20 years ago. The explanation for this is that there has been at least nine retirements over the last 15-20 years within the program's full time faculty. These full-time position openings are still in the process of being filled.

3. How does the FT/PT ratio benefit or harm the program?
   The FT/PT ratio indicated here does not account for the overload classes that many of the full time faculty request each semester. The higher the FT/PT ratio, the greater the benefit to the program. This is because the full time faculty members are able to maintain regular office hours and are more accessible to the students. Also, the full time faculty members are involved in department, division, and campus-wide responsibilities.

4. Do you have a faculty mentoring program? _____ Yes ___X__ No
   Describe.

5. How do faculty maintain currency in their field?
   The faculty maintain currency in their field by conference attendance and scientific journal subscriptions.

6. Fill in the faculty status data below and answer the questions that follow.

Name	Reassigned time (how much in %)	Currently on leave (check)	Retired in last 2 years (check)	FT hired last 3 years (check)	Anticipated to retire in next 3 years (check)
Jeanne Bellemin					
Nancy Freeman				X	
Steve Leonelli					
Jane Oyama					
Jessica Padilla					
Theresa Palos				X	
Lester Scharlin					X
Leigh St. John					
Margaret Steinberg				X	
Michael Stupy					
Simon Trench					
Robert Wakefield				X	

6a. How does this data impact the program?

The faculty status data shown in the table above indicate that the full time faculty is being replenished with new faculty members, and that there are few retirements planned in the near future. The faculty position filled by Robert Wakefield will once again have to be filled because he resigned his position after two years. The impact of this was minimized by the hiring of a full-time temporary faculty member, Dr. Thanh-Thuy Bui, and a department hiring committee is interviewing for a permanent replacement.

6b. Will this data affect the program in the future?

This data does not reflect the possibility that in five years there may be at least four retirements. With the present rate of replacement of full time positions, the program could experience a period of very low FT/PT ratios.

7. From this information, can you identify present and future staffing needs? _X__ Yes____ No
Explain.

Presently, the program needs include an anatomy instructor to replace the Wakefield position, and a biology instructor. As many as four additional biology instructors will be needed in five years.

8. What is the department doing to address any future staffing needs?

The department is currently preparing to hire a full time anatomy instructor to start in the fall of 2007. Additional full time anatomy and biology instructors are being requested and lobbied for by the dean.

9. Should a recommendation be written addressing the data? __X__ Yes _____ No
(If yes, list.)

Inasmuch as the program's growth is hampered by the lack of staff, it is recommended that priority be given to the hire of full-time instructors.

D. Planning

1. Do the program faculty and other personnel have a clear idea of what is happening in the program, where it is headed, what external changes are affecting it, and what changes need to be made in order to enable the program to adapt and continue to be successful? **Explain.**

The program faculty and other personnel are well aware of the present state of the program. Every semester, instructors must turn away students desiring anatomy, physiology, and microbiology classes because there are not enough sections of these classes that are offered because of the lack of instructors and classroom space to teach them. The faculty and technicians are constantly faced with updating their courses, and the costs associated with purchasing the needed supplies. Budget concerns are presented to the teaching and technical staff in order to solicit input for ways to best utilize existing supplies and budget and staff to accommodate program needs. Division council meetings and department meetings are regularly held in order to communicate to both teaching and classified personnel a clear idea of the current state of the program. These meetings are venues that allow the program staff to participate in planning the future of the program.

2. What data, not currently provided, would be needed in order to improve planning for the development of the program? **Explain.**

Faculty need a better idea of the actual program budget to better understand the constraints being placed on the program. Data showing money available for staffing and supplies, and data showing the itemized money spent on staffing and supplies would allow the faculty and staff to better understand the issues involved with the development of the program.

3. What major external changes or trends do you expect to be of particular relevance to your discipline in the next five years?

External trends of relevance will be the continued rise in the demand for health care personnel, the continued shift toward the molecular study of biology, and the increased cost of dissection specimens.

4. What will the implications of these changes or trends be for the program and how will the program need to respond?

The increased demand for health care personnel places an increased demand for the prerequisite classes of this program: anatomy, physiology, and microbiology. The program will need to respond by adding sections of those classes. Every semester, enough students are turned away from enrolling in those classes to fill two more sections each. Indeed, this is a rather low estimate. Dr. Bui, for example, turned away 50 students alone. This pattern is duplicated by all the other instructors. Ms. Padilla further noted that the majority of students in the survey indicated a reluctance to take these courses in the online format. If this is the case, then this might be a further justification for increasing the number of sections in this area. This would require more faculty to teach these sections, and more laboratory space to teach them in. (It should be noted that additional class space is available for more sections of Physiology; likewise, the staff has indicated a willingness to teach these additional sections).

Currently, the students are required to complete about 5-6 units of work in order to succeed in both Anatomy and Physiology. Further, the student survey indicated a desire to have these classes, together with microbiology, as five unit courses. Clearly, this would afford the students more time, improve student understanding, and, ultimately, their overall success, though data would need to be collected to support this thesis. Interestingly, this would be in keeping with a current trend among many colleges in the Western States (already common in many Eastern colleges) of gradually increasing the number of units in these courses.

The continued shift toward the molecular study of biology necessitates a commitment by the division to invest in the type of equipment and technology that is needed to teach with this perspective. Techniques such as gel electrophoresis, restriction digestion of DNA, polymerase chain reaction, and genetic recombination, must now become classroom staples, and a growing portion of the program budget must be devoted to the supplies needed to perform these each semester. Failure to do so could compromise the articulation agreements that our program has with the local universities.

The cost of dissection specimens such as frogs, fetal pigs, and cats has become prohibitive. The program budget can no longer absorb the cost of buying these specimens at the volume of past years. Instructors will have to shift to a greater reliance on virtual dissections with a limited number of preserved specimens for demonstration. The renovated classrooms have the infrastructure to incorporate computer terminals within the laboratory space, and the program needs to move in the direction of utilizing this infrastructure and equipping the laboratories so that instructors can shift their emphasis from the dissection specimens to the virtual dissection.

5. Based upon the information above, how would you like the program to evolve within the next five years?

Over the next five years, the program should evolve from the more traditional approach of teaching biological concepts with disposable specimens to one that incorporates more modern methodologies. Investment needs to be made in equipment that can be used each semester with minimum renewable supplies.

6. Should a recommendation be written addressing the data? _X__ Yes _____ No

(If yes, list.)

1) Increase the number of sections, faculty, and classrooms for the health science courses.
2) Invest in the technology needed to teach biology at the molecular level.

3) Equip the laboratories so that instructors can incorporate virtual dissection into their curriculum with decreased reliance on preserved specimens.

V. Conclusion

1. Prioritized Recommendations

1. Hire full-time anatomy and general biology instructors.
2. Construction of additional laboratory classrooms.
   Convert other NATS classrooms into laboratory rooms.
3. Hire additional classified staff to be available for new evening and weekend sections.
4. Increase the number of sections, faculty and classrooms for the health science courses.
5. Develop student learning outcomes and assessment instruments for the allied health and science-major programs.
6. Give priority to lab expenditures, like equipment and technology and consumables, to maximize students' hands-on experience.
7. Allot more money to be available for tutoring.
8. Invest in the technology to teach biology at the molecular level.
9. Equip the labs so that virtual dissections will eventually replace the use of preserved specimens.
10. Schedule regular meetings with the Nursing and Allied Health faculty.
11. Do the research needed to establish an English prerequisite for targeted courses to increase student success.
12. More library purchases of science books and journal subscriptions.

2. Major Needs

1. Cadaver(s)
2. Computer tutorial open labs and tutorial software
3. The hiring of a computer technician to support the increasing shift toward virtual labs (in lieu of a lab technician).
4. Facility improvements, such as better ventilation in the NATS and LS lab rooms, and deionized water supplied to the NATS laboratory classrooms and stockroom.
4. Necessary financial support to accomplish the above-named recommendations

3. Strategies

1. Block grant applications for equipment and software.
2. Conversion of NATS building's bottom floor into permanent laboratory classrooms.
3. Data collection by program faculty of the funds generated for the college by faculty admitting extra students. This data could be used to support the request for the college to reinvest this money into extra biology classrooms and faculty.
4. Data collection by the program faculty to establish the need for a hard prerequisite of English for Biology classes