

Executive Summary and Recommendations

CSUCI hired the first faculty in 2001 and opened for transfer students in 2002. The Bachelor of Science in Biology degree program was approved in 2001 and was implemented in 2002. Currently, the Biology Program offers four degrees: BS in Biology with five emphases, BA in Biology with four emphases, MS in Biotechnology and Bioinformatics, MS biotechnology and MBA dual degree. The program also offers a Minor in Biology and a Certificate in Biotechnology programs. The Program offers over 120 sections of classes and laboratories a year and has 253 majors in the undergraduate programs. The Program is support with \$1,654,967 from the General Fund and \$38,000 from lab fees. This self study report only covers the bachelor's degree programs in Biology.

The faculty and staff of the Biology Program are very proud of the progress that has been made since the inception of the Program in 2002. Starting with 37 students majoring in biology in the first year, it has grown to 253 majors for the Fall 2008 semester and a total of 137 graduates for the first six years. Of the graduates reported their status to the Program, there have been 32 graduates who went on to doctoral and master's graduate programs, 24 admitted into professional schools and programs, 29 hired by biotech industry and 2 admitted into teaching credential programs. The retention rate of the biology majors is at 72.33%, which is above the university's rate of 70.1%.

Per the mission of the Program to provide students with "highly valued" "analytical skills and a sophisticated expertise in life sciences", and the multiple emphases providing the opportunities for a wide array of career pathways, the graduates of the Program have gone on to professional positions in the biotech industry and academic institutions and programs throughout California and the States. Within this short period of six years the Biology Program has become

one of the leading academic programs at CSUCI and is recognized throughout California for its academic excellence.

One of the main reasons for the success of the Biology Program is the specific effort to meet the main goals of the University:

- Disciplinary and interdisciplinary approaches to education
- Experiential and Service learning
- Multicultural and international perspectives

Since most classes in the Program provide one or more of these teaching goals, the Program is able to provide a quality education to its student body and make them understand the need to be knowledgeable and skilled in their disciplines, to be able to integrate their knowledge with multiple disciplines, to have actual hands-on experiences, and be able to compete in a global community before graduating and starting their careers. The success of the Biology Program in meeting these needs has given the Program the publicity and extraordinary profile of a Program that attracts students who are intelligent and anxious to study in such a dynamic environment.

Of course, the Program could not have achieved the success without a qualified and experienced faculty. There are four tenured/tenure-track faculty and 12 experienced lecturers teaching in the Program. They have diverse backgrounds such as microbiology, immunology, cell biology, developmental biology, evolutionary biology, ecology, genetics, molecular biology and organismal biology to insure the students are exposed to learning experiences from all of these different areas. The faculty members are excellent instructors, actively engage students in pursuit of their scholarly activities and dedicated in their service to the university and the community. The Program Chair provides the leadership for both the faculty and students to be successful in the areas of interest. She insures the curriculum and program goals are coordinated and complementary to provide a supportive environment for the faculty and a rewarding educational experience for the students. Dr. Wang's recent work and

successful approval of a \$1,733,406 grant from the California Institute for Regenerative Medicine for program development and implementation of an emphasis in stem cell technology and laboratory management is just one example of the importance of her leadership to the Program.

With all the successes of the Biology Program, there are still many areas that can be improved to provide additional academic opportunities for the students. As the Program continues to grow in numbers and importance, it will be imperative that additional resources are provided to meet the demands of this growth.

Some of these requirements are:

- Additional tenure-track faculty. The Program should achieve a minimum of 50% of the faculty at the tenured/tenure-track status. The current ratio is 25%. With too few tenure-track faculty members, the current faculty members are often over-burdened. Many important tasks and responsibilities do not receive the much needed full attention they deserve.
- Significant increases in the program's base budget to provide the funding for not only operating and maintaining the sophisticated laboratories that are important for class instruction and faculty research involving students but also the time base needed for faculty to carry out scholarly work.
- Additional administrative and management support for the Geology and Nursing Programs to provide more time for existing management and administrative services to concentrate on the dynamic Biology Program.
- A new building to support the requirement for new laboratories, green house and animal facility.

The faculty and staff of the Biology Program are enthusiastic about the successes of the Program and anxious to continue these successes as the Program grows in the next few years. With the infusion of the additional

requirements mentioned above, the Program would be able to continue the academic successes, maintain its status as one of the premier Programs at CSUCI, and continue to receive the recognition as a Program that provides superior graduates who are educated and ready to assume successful careers in the many fields of Biology.

ELEMENT ONE

Defining Program Purpose and Ensuring Educational Outcomes

Criterion 1—The Program has a statement of its purpose and operating practices

Program mission statement/program goals

The Mission Statement for the Biology Program states: “The Biology Program of CSUCI creates and delivers excellent academic undergraduate and graduate programs in the biological and related sciences. It vigorously supports instruction, scholarly research and publication, engages and mentors students, and performs service to CSUCI and the community.”

The Mission Statement is supported by the Program Goals for the undergraduate programs:

- Provide students with the opportunity to earn a BS/BA degree in Biology from California State University Channel Islands.
- Prepare students to become highly valued with analytical skills and a sophisticated expertise in life sciences for such diverse vocations as scientific research, teaching, consulting, biotechnology, the health professions, public and private organizations.

In order to assure that the Program is meeting the Mission and Program Goals, the Biology Program has developed several “Touchstones” as measurements of success for the Program:

- We measure success by students’ degrees completed
- We measure success by students placed in productive careers
- We measure success by our students’ continuation in higher education

- We measure success by our faculties' professional publications, awards, conferences attended.

Distinctiveness of the program from that of other CSUs or elsewhere

As with most of the Biology programs in the CSU system, the CSUCI Biology Program offers BS, BA and MS degree programs that encompass the essential common elements of a general biology curriculum. What has made the academic programs offered by the Biology Program unique is the responsiveness of our curriculum design and development to the needs of the community, state and the nation. A workforce analysis was conducted before our first degree program was ever developed, which pointed to the increasing need of graduates with a cell and molecular biology background. That was the first degree program developed. Then, as the faculty gathered more information via surveys and regional studies, it became apparent that there was a severe shortage of skilled workforce in medical imaging, biotechnology, science education, health care professions, ecological and evolutionary studies and clinical laboratory science; hence the specific emphases were added. Using the same approach, the Biology Program developed the first professional science master's degree program, MS Biotechnology and Bioinformatics. Responsive to the advice from our advisory board, we also developed a unique dual degree program, MS biotechnology and MBA.

Relation of program mission to the University's mission and goals

The Biology Program is in full support of the main goals of the California State University Channel Islands mission:

- Learning within and across disciplines through integrative approaches
- Experiential and service learning
- Multicultural and international perspectives

Interdisciplinary Approaches

A major component of the university mission is to educate students within and across disciplines. The Biology Program offers 40 undergraduate courses within the vast field of biology, including the basic biology survey courses, cell biology, genetics, evolutionary biology, comparative physiology and molecular biology courses, as well as upper-division biology courses covering many unique specialty areas to the biology majors. The Program also provides a significant service, with 21 courses, to the campus-wide General Education (GE) to undergraduate students. The CSUCI Biology Program has built into the curriculum 12 courses (Appendix 15) that are cross-listed with other disciplines on campus, including business and economics, environmental science and resource management, psychology, political science, nursing and physics. Also the Program offers 2 online GE courses, 12 GE with built-in interdisciplinary and 2 service learning courses.

Experiential and Service Learning

Experiential learning is a major component of the university mission and the curriculum of the CSUCI Biology Program. Out of 67 courses serving the undergraduate degree programs, 54%, (Appendix 21) have an extensive experiential learning component. Among these courses, 28 have hands-on wet-laboratory experience, 5 have computer lab component, 3 a field component, with additional courses containing built-in field trips for students. Currently, none of the 4 tenured and tenure-track faculty members who have been responsible for curriculum development is a field biologist; however, an ecologist has been recruited and is scheduled to start in fall 2009. As the Biology Program grows in faculty number, the plan is to develop more field biology courses to strengthen this area of experiential learning.

While many college campuses have been cutting laboratory components from their biology courses or consolidating lab experiences into fewer courses due to added costs, the CSUCI Biology Program has been able to maintain these

valuable labs for the students because scientific principles can be best learned through these experiential learning activities.

Currently, there are two courses offering service learning opportunities to our students. Many students have taken BIOL 492, an internship course, over the last 6 years. Students have worked as interns at local hospitals, high schools and biotechnology companies to assist the daily work of the hospitals and companies or as science tutors for high schools students taking science courses. While they provide the services to these organizations, they gain hands-on experiences, which make these student graduates more competitive in their applications to professional schools, graduate programs or teaching credential programs. The second course, BIOL/UNIV 493, Service Learning at the Zoo, is a specialized course that allows students to visit the local zoos and provide service to the organization and learning the multiple aspects of the zoo.

Multicultural and International Perspectives

Courses designed and taught specifically to fulfill CSUCI's mission of multicultural education include UNIV 392, Science and Technology in Japan. This course (GE C3b) was created and co-taught by chemistry and biology faculty to give students from all majors the opportunity to explore the science and culture of another country. The course was approved by the University's Center for International Affairs and IRA funds were granted to offset student costs. Twenty-four students in 2006 and fifteen students in 2008 took an eight-day trip to Kyoto, Japan, during which time they studied Japanese horticulture, the atomic bomb, earthquakes, the Kyoto Protocol/climate change, "green" building design, the shinkansen (bullet train), and heavy industry/manufacturing. Students also interacted with science professors and graduate students at Kyoto University. Pre-trip coursework at CSUCI included studies of Japanese history, popular culture, cuisine, public transportation, and current events. Following the trip students presented the results of individual research projects at a University-wide poster session.

Other courses that have built-in components of multicultural and international perspectives include BIOL 213, 217, 301, 420, 421, and 432. These courses cover morbidity and mortality of infectious diseases which naturally lead to discussions of incidents of some of the most devastating infectious diseases such as HIV and AIDS among various races, ethnic backgrounds and different countries and their social and economical impact on the various populations and countries.

Dissemination of the mission statement/program goals

The mission statement (Appendix 6) and the program goals (Appendix 7) for the Biology Program are disseminated widely to all students and potential students. The Biology website (biology.csuci.edu) contains the mission statement and program goals along with many other facts and information about the program. In addition to the web site the information is provided in many other sources and venues:

- CSUCI Catalog
- Schedule of Classes
- Discover CI (on-campus day for admitted students)
- Orientation sessions held by Student Affairs

At the class level each Instructor list the Learning Objectives for that specific class in the course Syllabus (Appendix 8). Any changes to a class requirement or to the degree requirements are communicated to all students through the Blackboard system and the CSUCI web mail system.

Criterion 2—The program has identified its program learning outcomes and these are widely available to faculty, students and external stakeholders. Its learning outcomes are assessed and analyzed on a regular basis. Where appropriate, evidence from external constituencies such as alumni, employers, and professional societies is included in such reviews.

Course and Program learning outcomes

The Biology Program has worked to insure that the Learning Outcomes of the Program (Appendix 7) are definitely aligned with the Mission of CSUCI and the Mission of the Biology Program. To insure that these Learning Outcomes are widely available to the faculty, students and external stakeholders they are included in most materials published by the Biology Program (Appendix 16) and they are also shown in the CSUCI catalog and the Biology Program's website. In addition, the course Learning Objectives are shown in the course syllabus (Appendix 8).

To review that the Learning Outcomes are being met, at least one outcome is assessed (Appendix 20) every semester. After the assessments are analyzed, specific plans are developed to improve areas that are shown to be weaknesses or just to continue to improve the Program.

On an informal basis, inputs from the alumni of the Biology Program (Appendix 11) are solicited to help identify any academic area that needs to be strengthened. All of these inputs are used with the course assessment analysis to develop the final program of continuous improvement each year.

Criterion 3—The program accurately publicizes its academic goals, programs, and services to students, within the university and to the larger public.

The Biology Program uses both the electronic and print versions of the university catalog to publicize its goals, programs and services (Appendix 16). This catalog is distributed to potential students, current students, parents of students and the community at large. In addition, the Biology Program uses pamphlets, flyers, and other promotional materials (Appendix 23) to provide detailed information about the Program. At every opportunity the faculty and staff of the Program provide

information about the program at meetings with parents, students and interested members of the community. The Chair of the Biology Program participates in the CSU Biology Council meetings, many professional societies and organizations and the goals, programs, and services of the Biology Program at CSUCI are reviewed at these professional meetings.

Also there are other communication methods used by the Biology Program that involve related activities by the university. Some of these activities include:

- Discover Channel Islands (on-campus day for admitted students)
- Orientation sessions hosted by Student Affairs
- University and the Biology Program web site
- Science Open House Events
- Biology Program Newsletters
- Tour groups from local high schools hosted by the Biology Program
- Biology Symposia

Processes used for documenting student achievement of learning outcomes

The Biology Program requires that all students receiving a Bachelor of Science and Bachelor of Arts in Biology complete 120 units (Appendix 16). The basic requirements consist of:

8 Lower Division Units

39 Upper Division Units

73 Supporting and Other GE Units

Also the students must pass the Capstone class in their senior year with specific course prerequisites to be completed before enrolling.

Students passing courses required for the degree programs demonstrate achievement of course learning outcomes. The achievement of program learning outcomes of the biology students is documented by the Institutional Research

report of the number of students that have successfully completed and graduated from the BS/BA degrees from the Biology Program.

The Chair of the Program keeps a record of the number of students who completed internships, directed studies or independent research projects, awarded scholarships, awarded honors, completed the senior capstone course while students are in the program pursuing their degree. Based on students' self reporting mechanism, the Chair also keeps a record of the number of students who entered professional schools/programs, graduate programs, and are employed by biotechnology companies and other organizations after graduation from the Biology Program.

Many alumni from the Biology Program are recognized in the e-newsletter "BioScope" (Appendix 11) that is published by the Biology Program as well as in the university publications such as Current and Wavelength.

ELEMENT TWO—Achieving Educational Outcomes

Criterion 1—The program's expectations for learning and student attainment are reflected in its academic programs and policies, including the curriculum requirements

Curriculum requirements and graduation criteria

The Biology Program offers a BS in Biology with five different emphases and a BA in Biology with four different emphases. In addition, the Program offers a Minor in Biology and a Certificate in Biotechnology (Appendix 16). The curriculum requirements for each option are shown in Appendix 16. The Program tries to offer as many course alternatives as possible (Appendix 3), and all of the courses are offered with the frequency required for the students to graduate within a specified time frame (Appendix 4).

Alignment of courses with degree outcomes

For the Biology Program all of the courses that are required for graduation are aligned with the Program Learning Outcomes (Appendix 7). With the consistency of the courses following the Learning Outcomes the students are given a solid background in a biology curriculum. Also the students must take and successfully complete the Capstone class given in their senior year. This class requires the students to use the knowledge and background of Biology they have attained from their prior classes and apply that knowledge in real world simulated situations. After completing their course requirements and the Capstone course, the students are prepared to become successful in their chosen pathways in the field of Biology, whether in professional schools/programs, graduate programs, education, public or private organizations or academia.

Evidence of co-curricular programs supporting student academic goals

A strong point for the Biology Program is the encouragement for the students to take co-curricular courses and participate in co-curricular activities that have been developed with other academic and non-academic programs at CSUCI. Some of these non-traditional courses and activities have been developed with academic programs such as Anthropology, ESRM, Political Science and Business. A complete listing of the co-curricular courses and other examples such as co-curricular symposia and special events (Darwin Day and Earth Day) are shown in Appendix 15 and Appendix 21. Students are encouraged to participate in research projects under the supervision of faculty and research conferences to present their findings. In addition to the co-curricular courses, the Program also requires successful completion of the Capstone course for graduation. This course provides the students with the challenge of using the knowledge from their curriculum while they complete projects related to the biological field such as grant writing exercises and case studies.

A major objective of the Biology Program is to prepare students for the next phase of their careers, whether in the public or private sector. A Biology degree from CSUCI will also prepare the students for additional academic work in graduate schools and professional institutions. The use of co-curricular courses and symposia provide the curricular enrichment and professional experiences for the students.

Criterion 2—The program has identified its program learning outcomes and these are widely available to faculty, students and external stakeholders. Its learning outcomes are assessed and analyzed on a regular basis. Where appropriate, evidence from external constituencies such as alumni, employers and professional societies is included in such reviews.

Evidence of dissemination of course and program learning outcomes

There is a wide dissemination of the Program Learning Outcomes by the Biology Program. This distribution is made in an electronic format and hard copy to students, parents, and the general community. These Learning Outcomes are shown in the Biology Program Description of the University Catalog (Appendix 16) and in many pamphlets, brochures and website that are published by the Biology Program (Appendix 13). In addition, each class syllabus contains the specific Learning Outcomes expected for that class (Appendix 8). The Program website also contains all the specific Learning Outcomes expected for all the classes offered by the Program.

Evidence of continuous assessment of courses

The Mission Statements for CSUCI and the Biology Program (Appendix 6) are the guidelines for the Learning Outcomes for all of the courses taught within the Biology Program. Overall, the Biology Program has developed seven broad learning goals. Three of these goals pertain to conceptual knowledge and four address attainment of skills and experiences. From these learning goals, the Program has developed 10 specific Learning Outcomes. These Learning Outcomes are assessed each semester to insure the specific goals and outcomes are being taught. Materials in Appendix 20 shows the broad outline of the Biology Assessment Program and the results and recommendations from an assessment using embedded questions on an examination. In addition to the embedded questions technique instructors also use other techniques for their assessments such as lab exercises, mid-term questionnaires for the students, student surveys and procedural updates for lab manuals (Appendix 20).

Evidence of program modification following upon assessment of above activities

The Instructors for the Biology Program assess at least one Learning Outcome per class during each semester. They review the results from these assessments and determine any issues with the class in relation to the Learning Outcome. As part of the process of continuous improvement for the classes and the Program, the Instructors make appropriate changes (Appendix 24) to the course curriculum to insure that any gaps pertaining to Learning Outcomes are being filled. In addition the Chair of the Biology Program reviews all of the assessments at the end of each semester and takes appropriate follow-up action to insure that there is consistency for each Learning Outcome across the total curriculum. The curriculum has been modified several times since the launch of the BS Biology program in 2002. Not only new emphases have been added to the curriculum, but also there have been realigned course requirements to meet the program learning outcomes.

Student evaluation of teaching effectiveness

Student Evaluation of Teaching Effectiveness (SETEs) (Appendix 10) is required for each class. (The details of the CSUCI SETE policy can be found at the website <http://senate.csuciedu/policies.html>.) The students complete these forms near the end of each class. The forms consist of a 0-5 scoring scale of questions about the class and Instructor plus space for written comments and observations by the students. Overall, the Instructors from the Biology Program have excellent scores, usually in the 4.0-4.1 range. The tenure-track Instructors score extremely well with a range of 4.2-4.3 out of 5 points. These scores are a good indicator of the high quality of the instructions and resulting student satisfaction.

Part of the SETE process includes an opportunity for the Instructors to fill out a form that details any extraordinary conditions in the classroom or technological problems that interfered with their instructions. These issues are reviewed along with the SETE reports at the conclusion of each semester, and the Instructors receive the results at the beginning of the subsequent semester. The Chair of

the Biology Program reviews any issues with low or inconsistent scoring of an Instructor, and appropriate mentoring is given to the Instructor to help resolve any classroom issues or issues related to teaching effectiveness.

Criterion 3—Course learning outcomes are aligned with program learning outcomes disseminated to students and to faculty, including adjunct faculty

Evidence of student attainment of program learning outcomes

By completing all of the required courses for a degree in Biology the students will achieve the learning outcomes (Appendix 7) that are required by the Biology Program. These Learning Outcomes are published in the CSUCI catalog, Biology Program website, and many of the pamphlets and brochures that are produced by the Biology Program. In addition, the Learning Outcomes are available to all Biology Program faculty including the Lecturers, and the specific course Learning Outcomes are required to be posted in the syllabi of each class (Appendix 8). All the Program Learning Outcomes and course-specific learning outcomes are published on the Program's website as well. Each Biology Program faculty member is required to send an electronic copy of the course syllabi for their classes to the Program's office. These syllabi are available for review by the Chair and any involved faculty. There are several examples shown in Appendix 11 of undergraduate alumni that have completed the program and achieved the Learning Outcomes and then gone on to further professional success.

Criterion 4—The program actively involves students in the learning process, challenging them with high expectations, and providing them with appropriate feedback about their performance and how it can be improved.

Evidence of active student learning and student engagement in the program

The faculty of the Biology Program works diligently to insure that they have taught and mentored their students so they will be competent and knowledgeable in their field and have opportunities for progressing to advanced degrees or be successful in their future careers. It is imperative that the CSUCI Biology students have the best possible education in Biology and can compete against students from the CSU system and other universities.

The students receive mentoring from the faculty on an ad hoc basis and also each faculty member provides one hour of office time for each class they teach. The students can make appointments for mentoring or extra help during these office hours. Each biology major is assigned to a specific faculty member to serve as their academic advisor. Throughout their program of study, they are encouraged to seek advice from their faculty advisors for concerns in their study and the future careers. The chair of the program also offers regular group advising sessions to the biology majors to communicate with them about the class schedules, curriculum modifications and career options. In addition, faculty members encourage their students to participate in research activities. Faculty members who are active in their research recruit students into their projects and involve these students in the hands-on research activities. These students are also encouraged to participate in research conferences on campus, within the CSU system and other types of professional meetings. The curricular requirements and the related professional activities engage students and prepare students for their future in Biology after graduation.

To insure that the students understand their subjects in the Biology curriculum, the faculty provides both written and oral feedback about any work from a class such as papers, presentations, lab work, and projects. The purpose of these

critiques is to help the student better understand the subject matter and make corrections to enable the student to successfully complete the course.

There are many examples of Biology students being actively engaged in the program and achieving success. For the 2007/2008 school year 19 students completed faculty-supervised independent research projects, 6 biology students received university scholarships, and 14 students graduated and applied for acceptance in the MS Biotechnology and Bioinformatics program or the MS Biotechnology and MBA dual degree program. In addition to the data from 2007/2008, many more examples are shown in a summary of Student Accomplishments in Appendix 18.

Criterion 5—The program demonstrates that its graduates consistently achieve its stated levels of attainment and ensures that its standards are embedded in criteria faculty use to evaluate student work.

Evidence of student satisfaction (current and alumni)

The SETEs (Appendix 10) provide the best objective student evaluation of the Biology Program with consistently high ratings on the Instructors. In addition there are constant informal positive opinions given about their views of the Program's performance during office visits, before and after classes, and at professional organization meetings.

Tania Garcia, Director of Development and Alumni Relations for CSUCI has interviewed numerous alumni from the Biology Program and documented their satisfaction and professional successes after they graduated from the Biology Program at CSUCI. Appendix 11 provides an example of some of these alumni plus a copy of a speech by one of the alumnus, Elisabeth Freeman. This speech highlights her tremendous successes and extreme satisfaction with CSUCI and the Biology Program. In addition, the material in Appendix 11 shows the

numbers of students who gone on to success in both the professional and academic world.

Criterion 6—The program contributes to the mission-based elements of the University such as internationalism, interdisciplinary, service learning and civic engagement, and multiculturalism, and general education, as appropriate to the discipline.

Evidence of participation by students in service learning, international, multicultural and interdisciplinary experiences

Interdisciplinary

The Biology program offers interdisciplinary courses (Appendix 15) of two types. The first are those courses developed and cross-listed with other programs in order to fulfill curriculum needs that span disciplines. These courses often meet CSUCI General Education requirements in multiple categories and may be taught by biology faculty, faculty in other programs, or a combination of both. Examples include BIOL 212/PSY 212, Neurobiology and Cognitive Science (GE B2 and E); BIOL 260/NRS 260, Nutrition for Therapeutics and Health; BIOL 360/NRS 360, Pathophysiology; BIOL 313/ESRM 313, Conservation Biology; BIOL 315/PHYS 315, Introduction to Biophysics; BIOL 326/MGT 326, Scientific and Professional Ethics (GE D); BIOL 416/PHYS 416 Radiobiology and Radionuclide's; BIOL 434/PHYS 434/HLTH 434, Introduction to Biomedical Imaging (GE B1, E); and BIOL 464/PHYS 464, Medical Instrumentation.

Biology also offers courses specifically designed to meet CSUCI's upper division interdisciplinary (UDI) requirement, which, as defined by our Academic Senate, must “integrate content, ideas, and approaches from two or more disciplines” and “include substantive written work consisting of in-class writing as well as outside class writing of revised prose”. Examples include BIOL 331/BUS 331, Biotechnology in the 21st Century (GE B2, D, UDI); BIOL 332, Cancer and

Society (GE B2, D, UDI); BIOL 333, Emerging Public Health Issues (GE B2, E, UDI); BIOL 334, Natural History of Ventura County (GE B2, UDI); BIOL 342/BUS 342/ECON 342/EDUC 342, The Zoo: Conservation, Education, and Recreation (GE D, UDI); BIOL 431, Bioinformatics (GE B2, B4, UDI); BIOL 432, Principles of Epidemiology and Environmental Health (GE B2, D, UDI); and BIOL 433, Ecology and the Environment (GE B2, UDI).

Several of Biology's upper division interdisciplinary courses were developed in response to specific needs or unique CSUCI initiatives. For example, because the California Commission on Teacher Credentialing (CCTC) requires students pursuing a degree in Subject Matter Preparation in Biology to take an interdisciplinary science course, faculty in the Biology, Chemistry, and Geology programs collaborated and created BIOL 335, The Biosphere (GE B2, UDI). This course examines the atmosphere, lithosphere, and hydrosphere, as well as the evolution of life on earth, climate change, and other human impacts on earth's resources. BIOL345/POLS 345, Science and Public Policy (GE D, UDI) were developed by faculty in Biology and Political Science following receipt of an award from CSUCI's Center for Integrative Studies. Co-taught by a biologist and a political scientist, this course examines the relationship between science, politics and public policy-making and prepares students to make informed decisions regarding the societal implications of scientific research. Topics have included genetically modified food crops, human embryonic stem cells, public funding of science, endangered species, the pharmaceutical industry, NASA, and climate change, and in 2009, several students enrolled in this course will have the opportunity to study climate change in the Arctic National Wildlife Refuge in Alaska as a result of an award to the instructors from the University's Instructionally Related Activities Fund (IRA).

Experiential/Service

The Biology Program encourages experiential learning for the students of the Program on a voluntary basis and also with specific courses. Some examples are:

- Biology 433—Ecology and the Environment. In this class most of the labs are held off-campus in different ecological environments throughout the Ventura area. The students gain an understanding of the ecological process at work in the different environments. This class also provides the students the opportunity to present major ecological issues such as global warming to the entire campus community (Appendix 21).
- Biology 170—Foundations of Life Science. The course is designed for students who are interested in becoming elementary school teachers and the labs are “hands-on” to provide real-world experiences for the students.
- Biology 492—Physics Internships. The course is designed for students pursuing careers in clinical fields, medical imaging and biotech research. Many students go to local hospitals and biotech companies as interns to obtain real experience before graduation.

As described in Element One, 54% of our curriculum, 36 courses out of a total of 67 courses serving the undergraduate programs, contain experiential learning component as a key required element of the curriculum.

As the environment and economies of the world are changing, the Biology Program recognizes that it is imperative for the students to obtain the maximum amount of experiential learning to prepare them for work and academia after graduation. Other examples of internships and service learning are shown in Appendix 21.

Multicultural/International

Many biology courses offer students a unique multicultural perspective that explores the organic underpinnings of the diversity of human cultures – how genetics, environment, natural selection, resources, and chance have influenced the development of our physical and cultural human similarities and differences. Courses designed and taught specifically to fulfill CSUCI's mission of multicultural education include UNIV 392, Science and Technology in Japan. This course (GE C3b) was created and co-taught by chemistry and biology faculty to give students from all majors the opportunity to explore the science and culture of another country. The course was approved by the University's Center for International Affairs and IRA funds were granted to offset student costs. Twenty-four students in 2006 and fifteen students in 2008 took an eight day trip to Kyoto, Japan, during which time they studied Japanese horticulture, the atomic bomb, earthquakes, the Kyoto Protocol/climate change, "green" building design, the shinkansen (bullet train), and heavy industry/manufacturing. Students also interacted with science professors and graduate students at Kyoto University. Pre-trip coursework at CSUCI included studies of Japanese history, popular culture, cuisine, public transportation, and current events. Following the trip students presented the results of individual research projects at a University-wide poster session.

Criterion 7—The program demonstrates its academic degrees can be completed in a timely fashion

Data on course availability for different student constituencies

The Biology Program recognizes that many of the students in the Program are working adults and need to have schedule flexibility to balance their working lives and academic requirements. Also there is a percent of the students who have small children and they have to work around baby-sitting and childcare schedules. In order to meet the requirements of these students, the Biology Program has developed a class schedule that covers a 14-hour day to provide

many alternatives for class time. The Program's Class Schedule (Appendix 3) clearly shows that 30% of the classes being taught in the Spring 2009 semester are scheduled in the evening, taught on-line, or are taught as Independent Study. For key required courses, we offer both day and evening sections to accommodate the students' variable schedule.

Even with providing a diverse class schedule, there are still some students who cannot attend school on a full-time basis. To help all students, including those who are part-time, the Program has developed a "Graduation Road Map" (Appendix 4) with options for each area of emphasis in the program. With this "Graduation Road Map" the students can develop a four-year degree plan, a five-year degree plan, or a six-year degree plan.

With the diverse class scheduling and degree plans that allow the student to work at a four-, five-, or six-year degree pace, the full-time students, working adults and adults with small children have many options to complete their degree in Biology in a timely fashion. A Biology degree plan can be developed that will fit any unique requirements associated with the student's work/home responsibilities.

Data on student degree completion

The Biology Program has been very successful in its short time in existence. In AY 03/04 there were 8 graduates from the program. Since that first year there has been a steady increase of graduates each year, and as of the Fall Semester of 08 the Program has graduated 137 students. In the school year of 07/08 66.0% of the graduates were female and 34.0% were male. Other statistics about the graduates including race/ethnicity are shown in Appendix 9.

Data on average class size

For the Biology Program, the Dean's Office set the student/faculty ratio at 19. In fall 2008, we reached 22. Generally speaking, the enrollment cap for lecture classes for the major is set at 60 and for the lab classes at 24. Upper division major's elective classes often will have class size around 15. The class size for biology GE courses range from 20 to 100.

Data on student retention

The Biology Program has made significant improvements in student retention over the past five year. Starting with a reasonable retention rate in Fall 04 of 63.9%, it has steadily increased to a rate of 72.33% in the Fall of 08. This rate compares favorably with the overall CSUCI rate of just over 70%.

Criterion 8—The program values and promotes scholarship, curricular and instructional innovation, and creative activity, as well as their dissemination

Curricular participation of program in general education

The Biology Program believes that instructional innovation is a high priority. Most of the faculty uses their own web site or the Blackboard system to manage their courses and student projects. Those electronic systems provide the syllabi, class schedule, grades, blogs, an email system, and other technological support to optimize the learning opportunities in the course. In addition, the Program requires its students to complete General Education courses with a minimum of 36 units from the GE curriculum for all graduates.

Also, the Biology Program provides many classes that students from other disciplines can take as part of their general education requirements. There are 21 different courses in the Biology Program that count as General Education

courses for non-Biology students. Appendix 17 provides a list of these courses and the number of non-Biology students who have completed the different courses over the past 13 semesters.

Curricular participation of program in mission-based Centers

California State University Channel Islands sponsors four mission-based Centers: Center for Integrative Study, the Center for International Affairs, the Center for Multicultural Engagements and the Center for Service Learning. It has always been the policy of the Biology Program to support all four of these mission-based Centers.

To support Integrative Study the Biology Program provides many interdisciplinary courses and symposia that are combined with other disciplines such as Political Science, ESRM, Anthropology, History and Business. Examples in this area are Biol 334-Natural History of Ventura County and the Symposium, Understanding the Channel Islands: an Interdisciplinary Approach, held in the Fall of 2007. Additional examples of the symposia and a full listing of the interdisciplinary courses are shown in Appendix 15.

A main strength for the Biology Program is the diverse opportunities provided to the students for Service Learning. There are many courses and internships that are given that allow the students to participate in real world activities. An example of an internship is the Clinical Care Extender (CCD) Program. This example and other service learning situations are shown in Appendix 21.

Detailed description of development and implementation of courses and activities supporting Multiculturalism and Internationalism can be found in Criterion 6.

Criterion 9—As appropriate, the program implements co-curricular programs and activities that are integrated into its academic goals and programs, and supports student professional and personal development. Examples include clubs, lectures, sponsored activities, field trips competitions, and professional experiences.

Evidence of effective support from service units such as the advising center, the career center, student disabilities services, and student leadership

The CSUCI Advising Center is located in the Bell Tower and the Biology Program actively supports the activities of this Center. Biology students can make an appointment with an advisor or, to receive more informal advice, they can just walk-in to receive help. The Advising Center can provide one-on-one advising sessions with a professional advisor, or the student can use the web site that has been established to help them coordinate their academic program.

In addition to working with the Advising Center, the Tenured/Tenure Track faculty of the Biology Program also provide specific advice to the students for the Biology Program. The Tenured/Tenure Track faculty members divide the student population in biology into groups based on the last names of students and each faculty member acts as an advisor for her group. For specific advice about the Biology curriculum the students can make an appointment with their Biology faculty advisor or walk-in to get quick answers to less important issues. They could also seek advice from the Chair of the program.

The CSUCI Career Center (Appendix 27) provides career services to students and alumni of the Biology Program. The Career Counselors work closely with the students to make sure they receive the support needed for the many career options after graduation. As with the Advising Center, the Career Center provides an on-line service for prospective employers who want to target specific

recruiting efforts with CSUCI students and alumni. Also the Career Center coordinates job fairs and employment interviews throughout the school year to provide many employment exposure opportunities for the students.

For CSUCI students with disabilities, the Disability Resource Center (DRC) (Appendix 28) provides the structure necessary for accessible education. Another service of the DRC is to act as the liaison between the students with disabilities and the University community. The DRC works with the faculty of the Biology Program for the following items:

- Orientation to Disability Resource Programs
- ADA and Office of Civil Rights consultation pertaining to classroom accommodations
- Disability-related classroom accommodations
- Test proctoring services
- Addressing academic concerns as related to the student's disability

All course syllabi for the Biology Program contain the Syllabus Disability Statement (Appendix 8). This statement outlines the faculty member's willingness to provide reasonable accommodations to a student with a disability.

The biology majors have formed their student clubs and faculty advisors are involved in their organizations and activities.

Criterion 10—The program ensures students receive timely and useful information and advising about their academic requirements

Student advising is shared by faculty advisors in the Biology Program and professional advisors from the Advising Center (Appendix 32). The Program believes that academic advising is a constant process that provides the students with guidance throughout their college experience. However, it is ultimately the student's responsibility for planning their course work and meeting the graduation

requirements. Students should be familiar with the University course catalog and the policies that act as guidelines toward successful completion of a degree.

The biology students are encouraged to take advantage of the advisors at the Advising Center to ensure they are following the correct path to graduation. These advisors offer guidance with general education and graduation requirements, monitoring student's degree progress, undeclared major advising, clarification of academic probation policies, and other institutional policies and procedures.

The Tenured/Tenure-Track faculty of the Biology Program also offers advice and counsel to the students. The faculty divides the Biology student body into equal groupings and each faculty member provides advice/counseling to his/her group. In this way the students can receive clarification about course work toward a degree in Biology plus a mentoring relationship with a faculty member who can possibly help them with other issues such as internships and career opportunities.

Criterion 11—The program serves transfer students by providing accurate information about transfer requirements and ensures the equitable treatment of transfers with respect to its policies on degree completion

The entire lower division core courses that are part of the Biology Program curriculum adhere to standards that have been accepted at most Biology programs throughout the United States. The community colleges in the CSUCI service area have been consulted and there is a continuing communication with these colleges to guarantee a smooth transition into the CSUCI Biology Program. Formal articulation agreements have been developed and the Biology Program adheres to all of the standards outlined in the CSUCI Transfer Admission Guarantee (TAG) Agreement (Appendix 29). For the Fall Semester of 2008,

10.67% of the upper division students in the Biology Program were transfers from other colleges.

ELEMENT 3

Developing and Applying Resources to Ensure Sustainability

Criterion 1—program employs faculty in sufficient number, and with appropriate ranks, professional qualification, and diversity to support its academic program consistent with its educational objectives.

Summary of faculty qualifications

The Biology Program has an outstanding faculty with a blend of tenured and tenure-track professors (Appendix 12) plus an experienced group of full-time and part-time lecturers (Appendix 13). There are 3 tenured, 1 tenure-track professors and 12 lecturers on the Faculty. The faculty has been chosen with backgrounds in the different areas of biology such as microbiology, immunology, cell biology, developmental biology, evolutionary biology, ecology, genetics, molecular biology and organismal biology to ensure that the students of the Biology Program receive instructions from experts in many different biology areas.

Most of the lecturers have several years of experience teaching in the biology field and they have backgrounds in a wide range of biology subjects.

All faculty members are expected to maintain contacts in professional societies and the general biology community. They provide instruction to students at CSUCI, engage in scholarly pursuit, work with local community colleges, public and private organizations, attend professional conferences, and present papers to disseminate their research findings (Appendix 14).

Faculty characteristics-professional, demographic, rank, tenure track

Currently, the Biology Program has 4 tenured and tenure-track faculty members, all of which are females. There are 1 full professor, 2 associate professors and 1 assistant professor. There are 12 lecturers teaching for the program as well. All faculty members teaching for the program have PhD degrees. Many of them have diverse backgrounds, professional and international experiences in their chosen specialty of biology and are bi/multi-lingual. This language expertise is a major advantage working with students on international trips and helping foreign students with their class work. The degree of versatility of teaching capability among faculty is also very impressive, which allows the Program to offer a wide variety of biology courses covering multitudes of disciplines in the broad field of biology. The Biology Program just recruited the fifth tenure-track faculty member, who is going to be an assistant professor. He is going to join the program in fall 2009.

In addition to their academic work, several of the faculty members have valuable work experience at different settings. The faculty is engaged in scholarly pursuit that involves graduate and undergraduate students in biology. The entire faculty has been published many times and they have a solid record of giving presentations to professional societies and acting as guest lecturers for different symposia and classes. Details of each faculty member are shown in Appendix 12.

Assessment of faculty hiring and orientation practices, including adjunct faculty

For hiring purposes, academic and professional expertise is the main factors for the recruiting and hiring decisions for the Biology Program. The potential faculty members should have experience in different areas of Biology so there is a broad spectrum of knowledge and experience in the overall Biology faculty. The process for hiring tenure track faculty begins at the University level. The total faculty rather than individual disciplines performs the initial interviewing. Each Program works with the Dean and Provost to develop an approved level of hiring. Then Discipline Search Committees (DSCs) are formed and faculty from different disciplines assigned to each Committee.

The DSCs review the applications, conduct phone interviews, and recommend candidates to bring to campus. The Office of Faculty Affairs invites the selected candidates to campus, with about 20 candidates per week for three weeks, in February of each year. Each group of candidates arrives on Thursday and has interviews with the President, Provost and Dean.

On Friday, the interviews continue with the faculty. The first interview is a breakfast interview with all faculty and the candidates to get an overview of the Programs. During the day each candidate is scheduled for a teaching demonstration, an interview with the DSC, and time in the hospitality room to meet with faculty, a campus tour, and an interdisciplinary session. During the interdisciplinary session, five candidates from various disciplines are given a prompt instructing them to work collectively to devise an interdisciplinary course. Current faculty observes the group while they work on their proposed program.

When the interview process is complete, the Chair of the Biology Program, with inputs from the Biology faculty, makes hiring recommendations to the President, who makes the hiring decision.

Lecturers are hired through an online application process followed by an interview with the Chair of the Biology Program. All hiring complies with the

policies and procedures outlined in the CFA Contract. (Contract available on-line at <http://www.calfac.org/contract.html>)

After being hired, all new faculty including Lecturers are required to go to a New Faculty Orientation (Appendix 33) as part of their general preparation before starting their first semester of teaching at CSUCI.

Full time/part time faculty ratios

The Biology Program has a very low percentage of full-time tenured/tenure-track faculty due to the severe budget constraints placed on the Program. The current ratios are:

Full-time tenured and tenure-track	4	25%
Temporary faculty	<u>12</u>	<u>75%</u>
Totals	16	100%

The Biology Program has been successful in attracting a total of 5 qualified tenured and tenure-track faculty since the program started in 2001, including one tenure-track faculty member who will join the program in fall of 2009. However, considering the complexity and diversity of the numerous disciplines covered in the broad field of Biology, there is still a large gap to fill. The goal is to have a minimum of half the faculty at tenured and tenure-track status and to maintain that ratio as the Program continues to grow. With the current state budget crisis, it will be difficult to achieve the proper tenured, tenure-track and temporary faculty ratio, but the goal will remain the same until it is achieved.

Professional, scholarly, creative accomplishments of the faculty

The Biology Program has a talented and diverse faculty that has many professional accomplishments. Their participation ranges from publishing in professional journals, working with professional associations, obtaining grants, and attending professional conferences. The work by this faculty is distributed in

publications in professional journals, books, proceedings, posters, booklets, press articles and speeches delivered in conferences and symposia. (http://library.csuci.edu/wasc/ace_proofs/103_Hutchinson_Symposiums.pdf).

Some examples of accomplishments by the biology faculty include:

- Dr. Angela Chapman received a \$68,000 grant from the Department of Interior as part of the Shoreline Study of Coastal Birds in Ventura.
- Dr. Amy Denton spoke at the Eukaryotes Small to Large: Genome Evolution, Cell Biology, and Molecular Medicine Symposium at the University of Washington in 2007.
- Dr. Dr. Steve Norris publication of “Family Malapteruridae” in The Fresh and Brackish Water Fishes of Lower Guinea, West-Central Africa, in press.
- Dr. Nitika Parmer presented a guest lecture at the Department of Biotechnology; Panjab University, India entitled “Stem Cell Cloning.”
- Dr. Ching-Hua Wang was an invited panelist for the Professional Science Master’s Program Workshop at the CSUPERB Annual Biotechnology Conference in 2008.
- Dr. Ching-Hua Wang received a grant of \$1.73 million in support of development of an Emphasis in Stem Cell Technology and Laboratory Management for the professional science master’s program.

Many other examples of faculty accomplishments are shown in Appendix 19 and the faculty members’ CVs.

Criterion 2—The program employs professional staff in sufficient numbers and with appropriate experience to maintain and support its academic programs

Evidence of sufficiency of professional staff

The Biology Program has excellent administrative support for the administrative functions of the Program plus outstanding technical support for the laboratory work that is required to supplement the class work. Jessica Dalton provides the administrative support for the program and she works directly with Dr. Wang,

Chair of the Biology Program. In addition, Jessica also administratively supports the Geology and Chemistry Programs. Her academic work—BA in English from Cal State Northridge and progress toward a BS in Biology from CSUCI-- has prepared her well for the position as Faculty Support Coordinator for the Biology Program.

There are two Instructional Support Technicians I, Shannon Andreoli and Kimberly Gardner, one Instructional Support Technician II, Catherine Hutchinson, and one Instructional Support Technician III, Michael Mahoney, all of whom provide laboratory support for the Program. Their main duties are lab preparation, set up, break down and clean up. They work closely with the instructors to insure they prepare the labs to support the material being taught for each class during the semester. They also order and stock the supplies that are needed in the labs and manage biological waste products generated from the labs. An additional duty is to train the student assistants who also help the instructors during laboratory work.

All of the Instructional Support Technicians have impressive academic records that provide the technical background for their lab support. Shannon has a BS in Biology from UC San Diego and Kimberly has a BS in Biology from CSUCI. Catherine has a BS in Biology from Cal State San Bernardino and a MS in Biotechnology from CSUCI. Michael has a BA in Biology from the University of Bridgeport and a MS in Biology from the University of Connecticut. Details of the backgrounds and professional qualifications of all of the support staff are shown in Appendix 22.

Criterion 3—Faculty workload, incentives, and evaluation practices are aligned with institutional practices.

Alignment of faculty hiring and rewards policy and University practices

The CSUCI General Personnel Standards provide the overall guidance for Retention, Tenure and Promotion within the University. Specifically the Standards state: "CSUCI is committed to achieving excellence in teaching, student learning, scholarship, and University development within a culture of collective responsibility." The Retention, Tenure and Promotion Schedule (Appendix 1) and the complete University RTP policy (<http://senate.csuci.edu.policies.htm>) are the documents that are used to insure that the hiring and rewards for all faculty members is fair, equitable and match University Practices.

In addition, the Biology Program has developed program-specific Personnel Standards (PS) (Appendix 31) that supplements the University guidelines and provides policies and procedures for Retention, Tenure and Promotion within the Program.

Full time faculty workload

The Biology Program has been able to maintain a highly reasonable average student/faculty ratio (SFR) of 19 for all classes and labs, considering the limitations of enrollment cap for lab courses. In fall 2008, the SFR reached 22. The maximum for certain General Education lecture class is 100 students. The maximum for biology classes serving the biology major is 65, with most of courses set at 30 for lecture or 24 for lab unless the Instructor grants permission for additional students in a particular class. All faculty members maintain a minimum of one hour of office time for each three-hour class taught during a semester. Also the faculty work hard to maintain informal contacts with the students to identify any course issues and to make sure all students understand the basic learning outcomes of their classes.

The general workload for the Tenured/Tenure Track Instructors is 15 Weighted Teaching Units (WTU). Of the 15 WTUs, 12 are used for teaching assignments

and 3 are used for service and committee work. Lecturers are assigned 1-15 WTU each semester based on the overall needs of the Biology Program. The WTUs associated with assigned time for work such as serving as chair, lab coordination, student advising, being CFA representative, grant director or advisor, faculty research course (UNIV 498), assessment activities, have allowed the program to reduce the teaching load for tenured and tenure-track faculty members to an average of 9 WTU.

Evidence of contributions by faculty to university and community service

The Biology Program believes that it has a continuing responsibility for ongoing contributions to the University and general community. Some examples of the projects and programs that are part of this contribution are:

- Sponsored the Annual Reading Celebration event with Dr. Jared Diamond as the speaker in 2007 and Darwin Day event in 2009.
- Dr. Steve Norris hosted “The Desert Fishes Council Conference” meeting in Ventura. This Conference was a multicultural, international and multilingual event with 180 attendees from the United States and Mexico, 2007.
- The Biology Program sponsored Earth Day events on campus.
- Each semester, the Biology Program organizes a major scientific symposium for the general student population on campus and the community members. These events have been organized since 2005 and have always been very well attended.

Many other campus and community “Events” that are sponsored by the Biology Program are shown in Appendix 14.

Criterion 4—The program supports appropriate and sufficient faculty development opportunities that are designed to improve teaching and learning.

Evidence of participation in faculty development opportunities

The Chair of the Biology Program believes that the faculty should have every opportunity for personal and professional growth. The faculty is encouraged to pursue professional development in their chosen field. The use of mini-grants that are provided by CSUCI for faculty members are available for research or assigned time and many Biology faculty members have utilized this opportunity. The university also provides sabbatical leaves for research activities in their academic field of interest. Built-in the Biology Program budget is travel fund to support faculty attending professional conferences to present their research findings and exchange scientific papers with their professional peers.

The Chair of the Biology, Geology and Nursing Programs takes an active interest in all new faculty and probationary faculty. These faculty members are counseled to help them achieve success in their teaching duties plus understand how their position fits into the overall mission of the Biology Program and CSUCI. The goal is always to help this group of faculty be successful and continue to improve as outstanding instructors.

CSUCI Faculty Development Office is another resource for all faculty members. This organization provides teaching and counseling tips for instructors in addition to sponsoring seminars and workshops that provide development opportunities. Services provided by the Faculty Development Office expand awareness, opportunities, and choices for professional practices and instruction beyond what an individual faculty member is likely to have time to uncover or discover alone. Details of the Faculty Development Office can be found at <http://facultydevelopment.csuci.edu>.

Evidence of student involvement in service unit activities

The BS/BA in Biology degrees are designed for students who wish to enter medical, dental or other health professional schools or programs, graduate schools, and teaching credential programs. Other options are careers in business, industry or government. The Biology Program believes that it is very important for these students to have experiential/service exposure in addition to the classroom experiences to get students prepared for their careers after graduation. In order to have the opportunity for service activities, the Program has developed many classes that provide this type of learning. An example of a course is Biology 492 Internship, which provides service activities. In addition, examples of work in other courses and internships are shown in Appendix 21.

Criterion 5—Fiscal and physical resources are aligned with program educational goals and are sufficiently developed to support and maintain the kind of educational program it delivers.

Effective use and management of budgetary resources

Main funding for the Biology Program comes from three sources:

- State of California general fund
- Student fees
- Continuing Education Reserve Fund (CERF)

The funding for faculty and staff wages and benefits plus instructional support materials and supplies come from the first two sources. The CERF funds are for special projects that are used to improve and enrich the overall Biology Program.

The annual budget for the Program is:

Salaries and Benefits	\$1,500,000
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Operating expenses	<u>\$ 125,000</u>
Total	\$1,625,000

The Biology Program takes great pride in managing this budget and staying within the dollar limits while still providing a superior academic program for its students. It is a cost effective program for CSUCI and the Biology Program students.

Quality and adequacy of physical facilities-labs, studios, unique classrooms

The Biology Program shares classrooms, library and office space with other CSUCI academic programs. On average, the Biology Program utilizes 11 classrooms for 161 hours per week and 12 offices on a permanent basis. Also the Program utilizes 5 labs for both class and research work. There are 60 computers located in these classrooms and labs that can be utilized by the Biology Program and other programs.

In addition to the above classrooms, office space and labs, the Biology Program has access to 123 computers on campus that are located in three computer labs in Ojai Hall and four computer labs in the Bell Tower (Appendix 5). With the opening of the new Broome Library, there are additional computers available to all students.

Overall, there is an acute shortage of key facilities that are needed to support a growing and dynamic Biology program. To maintain a superior status as both a research and teaching program, Biology should have at a minimum a green house and an animal facility. Also, the current lab space in Chaparral Hall is being shared by Biology and Chemistry and is much too small for either program. Because of this limited space there is not a separate research lab for the faculty, as the existing lab has to be shared by faculty and students. In addition to being undersized, this lab does not have the proper support facilities such as deionized water for a wet lab and a dedicated area for cell cultures.

The existing laboratory facilities also need to be maintained to meet the minimum acceptable levels to be used in student work and research. The budget (Appendix 35) shows that the needs-maintenance, calibrations, service-have far exceeded the budget by a factor of over 2 to 1. Only by using CERF funds has the Biology Program been able to provide the maintenance, calibrations and services to keep the laboratories at a reasonable standard.

Unfortunately, these facility shortages have not been funded in any past budgets and the program continues to just meet the minimum teaching and research requirements without these facilities. As the University and the Biology Program continue to grow, these limitations will become a more acute hindrance to the ultimate success of the Program.

Recently, the campus purchased several mobile labs that are being converted into instructional and research lab space.

Effective use of communication technology in instructions

California State University Channel Islands has selected the Blackboard System for the electronic communication system for the students and faculty. This system is a web-based course management program that allows instructors to present course material and interact with their students via the web. All the instructors in the Biology Program use this system with their students to electronically expedite class information such as lecture materials, grades, syllabus, answer class questions, and quizzes. Details of the Blackboard system can be seen at csuci.blackboard.com.

Recently, several faculty members have tried to use various computer programs to convert courses either entirely or partially into online versions. This

modification has made the courses more accessible to a larger population of students, who could not enroll in classes on campus due to various reasons.

Evidence of involvement of external stakeholders in program

The Biology Program uses a Biotechnology Program Advisory Board (Appendix 25) as a voluntary and independent resource to the Program. This Board was established to provide input to the MS in Biotechnology program, but some of their information also applies to the undergraduate Biology Program. Members of the Advisory Board consist of business people and academics from the southern California area. The Board's general purpose is to help promote the visibility of all the Biology Programs at CSUCI in the southern California region and within the California State University system.

On an operating basis the Biotechnology Program Advisory Board gives strategic and technical input along with non-binding recommendations to the Chair and faculty of the Biology Program. An important role for this group is to help all the Biology Programs interact with the business community in southern California and to provide opportunities to students and promote accomplishments of the students and faculty of the Program.

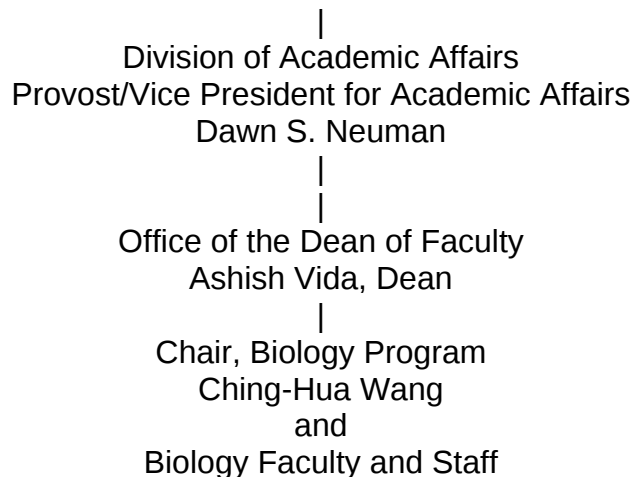
Criterion 7—The program's organizational structure and decision-making processes are clear and consistent with university policies, and effective in supporting the system

The Biology Program is contained within California State University Channel Islands.

The direct chain of command for the Program is:

Office of the President
Richard R. Rush, President

|



The CSUCI Academic Senate and the By-Laws of the Biology Program are the governing policies and procedures for the Program. The Chair of the Program, Dr. Wang is responsible for the overall management of the Program. Per the governing By-Laws, the faculty of the Program has the opportunity to provide input and guidance. A copy of the Program By-Laws is shown in Appendix 30 and it shows the specific responsibilities of the chair, faculty and various Program committees.

Faculty participation in program governance

The Biology Program uses its By-Laws (Appendix 30) as the guide for faculty participation in governing the Program. These By-Laws provide the methods for the faculty to participate in the management of the Program such as allocation of re-assigned time, peer evaluations, and any other related matters. For personnel matters, the Program Personnel Committee (PPC) will review faculty's files during the process of retention, tenure and promotion. There are either three or five members of the PPC, and they come from the tenured/tenure-track faculty. An Evaluation Committee by tenured faculty members provides evaluation of full-time lecturers. Tenured and tenure-track faculty members also participate in the evaluation of part-time lecturers in coordination with the Chair of the Biology Program.

In order to keep the entire Biology faculty informed of opportunities and issues pertaining to the Program, the Chair uses both formal and informal methods of communication (Appendix 34). The annual faculty meeting before the beginning of the fall semester is used to communicate issues and new programs, and to solicit input from the faculty pertaining to these items. Before each program meetings, the chair will call for agenda items from the faculty and staff to be placed on the meeting agenda for discussion. Because of varied schedules and responsibilities, the Chair of the Program frequently uses email to communicate specific issues and opportunities to the faculty during the academic semester to ensure they are informed on a timely basis and have an opportunity to respond as soon as possible.

Criterion 8—Where appropriate, the program has an advisory board or other links to community members and professional groups to support its educational mission

The Biotechnology Program Advisory Board (Appendix 25) has been formed to support the MS in Biotechnology Degree. This group consists of industry, business, government, community and student leaders. The basic function of this group is to make suggestions for the Biology Program and to provide counsel and support on issues that apply to the CSUCI Biology Programs.

Because of the broad membership of the Board they are able to help develop the visibility of all of the CSUCI Biology Programs in the southern California region. They also interact with the business community to provide opportunities and promote accomplishments of the students in the Biology Programs. This promotional activity is a distinct help for the students when they move on to their careers after graduation. Members of the Board have provided internship opportunities to the biology undergraduate students and have helped to employ graduates of the Biology Program upon students' completion of the degree program.

ELEMENT FOUR—Creating an Organization Committed to Learning Improvement

Criterion 1—The program periodically engages in planning activities that assess its strategic position, articulate priorities, and examines the alignment of its core functions with those of the institution

Description of planning processes and monitoring of future directions

The Biology Program completed a comprehensive strategic review (Appendix 26) of the total Program in March 2008. As part of this review, the Mission and Vision of the Program were updated to reflect the prior accomplishments of the Program and future opportunities. A Strengths, Weaknesses, Opportunities, Threats (SWOT) analysis for the Program was completed as part of the review. With this analysis specific issues and opportunities were identified and a five-year Initiative for the Program was developed.

The short term Initiatives that were identified included hiring more tenure-track faculty, acquiring functional research space and completing the five-year Program Review. Progress has been made for all three of these Initiatives and the first two items should be completed within the next few years assuming there are not major reductions in budgets by the CSU system. The Program Review is being conducted and will be completed on schedule in 2009-2010.

The longer term Initiative is to complete a new building for the science programs. This building is on the CSUCI project list and has tentative funding for starting the planning of the project. The only obstacle for completing the project would again be major budget cuts by the State.

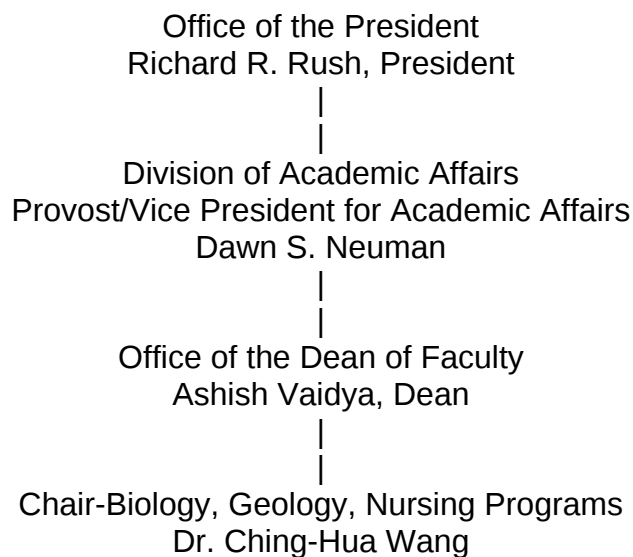
The intent of the Biology Program is to update the five year Strategic Plan on a periodic basis to make sure the planning for the Program reflects the realities of the University budget and new academic opportunities. The Program has seen a tremendous increase in students graduating in the first five years of existence and the business community and academia have recognized the excellent reputation of the Program and its graduates. Assuming funding can continue, the Program will continue to develop into a significant asset to CSUCI and the southern California community.

Criterion 2—The planning process aligns curricular, personnel, fiscal and physical needs with the program’s educational goals, and these planning processes are informed by data and student learning outcomes.

Assessment of program organizational structure and decision-making processes

The Chair of the Biology Program also has responsibility as Chair of the Geology Program and the Nursing Program at CSUCI. In addition, the Chair is Director of the MS Biotechnology and Bioinformatics Program. All of these Programs must receive the attention and managerial direction to keep them robust and viable as part of the curriculum at CSUCI. With the growth of each of these programs over the past few years, the job of Chair has become increasingly difficult and time-consuming.

The chain of command for the Biology Program is as follows:



The Nursing Program has a Director that carries many administrative responsibilities for the program. However, whenever there is a need for a program chair's signature and approval, the Chair of Biology, Geology and Nursing has to provide the service. Thus the Chair is responsible for all functions that are performed in all three Programs. The advantage to this organization structure is the ability to have a unified vision and management of all three programs. The obvious disadvantage is one person not having the proper amount of time to spend with each program to insure that all of the major issues and opportunities are being addressed.

Criterion 4—The program has faculty professional development plans (PDP's) in place, designed to facilitate scholarship and professional growth

As part of the commitment by the Biology Program to develop an atmosphere of continuous improvement by the faculty, the Program requires all recently hired tenure-track faculty to submit a Professional Development Plan in their first year of service. The process for developing and reviewing these plans are shown in CSUCI's Retention, Tenure, and Promotion (RTP) Schedule A (Appendix 1). Also a copy of PDP for a current tenure-track probationary faculty is shown in Appendix 1.

Recommendations on Program Improvement

The self-study will conclude with specific recommendations for program improvement. These recommendations should be clearly linked to evidence provided in the self-study narrative and be framed as actionable items that if undertaken by the program faculty and staff, and by others in the wider University, will improve program quality.

The Chair, faculty and staff of the Biology Program have worked very hard in the past few years to develop a well-respected and highly recognized program. Identifying the specific needs for the community and developing the five biology emphases within the BS Biology and four emphases within the BA Biology degree programs has brought respect and praise from the academic community and the business community in southern California. Because of this recognition, the Biology program has been able to attract quality freshman and transfer students into the program. In Fall 2008, the average high school GPA of our students is 3.29, with averages of mean ACT and SAT at 22 and 1019, respectively. The Biology Program places continuing emphasis on disciplinary, interdisciplinary and experiential learning that provides the students the opportunity to learn the fundamentals in biology and related disciplines as well as real-world applications of biology.

As discussed in the Self Study there are several areas in the program that need improvement in order to maintain the outstanding Biology Program at CSUCI.

The basic needs are:

- Increase in tenure-track faculty. Our most urgent needs are in physiology, microbiology, marine biology and neurobiology.
- Increase in base budget to support the laboratories and maintain these labs at the level required for basic faculty and student research and to support time base needed for faculty scholarly pursuit involving students.

- Additional administrative and management support for Geology and Nursing Programs that are being managed by the Biology Program.
- A new building to support additional laboratories, a green house and an animal facility for instructional and research purposes.

In order to maintain this outstanding program, it is imperative that more tenure-track faculty can be hired. The goal is to have 50% of the faculty at the tenured/tenure-track level and that means a minimum of four more tenure-track faculty must be hired in the near future. This hiring assumes a steady number of students in the program. As the program continues to grow, the number of tenure-track faculty will also have to increase in order to maintain the 50% ratio.

Biology is an extremely broad field encompassing many disciplines, such as organismal biology, cell biology, molecular biology, genetics, evolutionary biology, microbiology, immunology, cancer biology, anatomy, physiology, plant biology, marine biology, neurobiology, vertebrate and invertebrate biology, parasitology, mycology, toxicology, ecology, conservation biology, virology, hematology, developmental biology, bioinformatics, biostatistics, just to name a few. Each of them is a comprehensive discipline in and of itself. Over the past six years, we managed to hire faculty members with the most versatility in teaching to cover a significant number of the disciplines. However, many of the disciplines have made momentous advancement in recent years. If a faculty member is not trained in a particular discipline, she/he cannot keep up with the rapid development and progression of the discipline and cannot provide the current knowledge and skills in the discipline to the students. We need to hire expertise educated in these areas to provide the most up-to-date knowledge and skills in these disciplines to our students to ensure their comprehensive quality education from our program.

As the program advances there is a huge requirement to improve the service contracts and maintenance of the existing laboratories. A minimal budget of \$15-

20,000 per year is available for the existing labs, but this does not provide the support for first-class laboratories. Many instruments purchased in 2002 are entering their aging phase and are in need of regular service and maintenance. The cost of such services has increased steadily over the years. This budget should be increased to at least \$50,000 annually so service contracts can be negotiated to provide the proper maintenance and service for each lab.

With the growth of the Biology Program and the additional responsibilities of the Geology and Nursing Programs, the management and administration of all three programs has been stretched to a breaking point. There is one Chair for all three programs and one Faculty Support Coordinator providing assistance to Biology, Chemistry and Geology programs, with a combined budget of \$ 2,677,658 (Biology- \$1,846,644, including general fund, lab fees and CERF; Chemistry- \$721,061, *ibid*; Geology- \$109,953, general fund). The Chair also manages the MS Biotechnology and Bioinformatics program and the MS Biotechnology/MBA dual degree program with a total enrollment of 183 graduate students in the last three years, supported by additional operating budget of its own. Due to the science programs' perennial need to purchase lab supplies and carry out lab maintenance, the work load for the Chair and the Faculty Support Coordinator is extremely heavy. Consequently, they do not have the time to give proper support to maintain each program at the high level required and expected. At a minimum there should be a Chair hired for the Nursing Program along with a Faculty Support Coordinator specifically for the Biology program. This would provide relief for the existing Chair of the Biology Program to give the time necessary to manage the growth of the program to exciting new levels.

As covered in the Biology Program Strategic Plan, there is an immediate need for an additional building to support the program. This building would house state-of-the-art laboratories that would have the facilities for deionized water for wet labs and an area with a controlled environment for cell cultures. Also in this

building or in one of the existing buildings on campus there is a requirement for a green house and an animal facility.

The Biology Program at CSU Channel Islands has become a dynamic program that is recognized throughout the region as an excellent academic program. As a result it has attracted a very high level of students that have gone on to success in business and academia. Many examples of these students are given in the Appendices of the Self Study. The Program is now at the point it needs to expand and continue to grow in order to meet the increasing needs from the community. The recommendations for additional tenure-track faculty, additional operating budget support, relief from the additional academic programs and a new building are appropriate to support the growth of the Program.

Understanding that the current economic conditions make it difficult to meet all of these needs, it is imperative that a viable plan is developed to insure that each of these requirements is implemented within the next 1-3 years.