The Department of Biology is undertaking its first Undergraduate Program Review in sixteen years by addressing the issues outlined in the Sonoma State University Program Review Policy approved by the President in March, 2006 (Policy-1). Below we summarize the Department’s self-study, external reviewer’s report (including recommendations), and our proposed short and long term action plans.

Program Summary: The Department of Biology offers two broadly based bachelor’s degrees (B.A. and B.S.), and a minor in Biology. Within these degree programs there are opportunities for selecting a specific concentration. The minor provides the student a rigorous background in biology supplementing the student’s major. A congenial atmosphere allows students to develop a close relationship with peers, graduate students, and faculty. An emphasis is placed on laboratory and field courses, and on student participation in research. Laboratory instruction provides students with hands-on opportunities with many technical aspects of biological inquiry. Laboratory and greenhouse facilities exist for maintaining live material for classroom use and student research. A radioisotope laboratory and a laser scanning confocal imaging facility are also available for student use. Field courses draw upon the unparalleled diversity of habitats in the North Bay region. They also capitalize on two spectacular nature preserves: the Fairfield Osborn Preserve and the Galbreath Wildlands Preserve. In addition, the department maintains museum collections of local plants, algae and fungi (North Coast Herbarium of California), vertebrates (Jack Arnold Vertebrate Collection), and insects and other invertebrates.


Learning Objectives: Our undergraduate curriculum, supported by physical sciences and mathematics, provides students with a well-rounded exposure to the breadth of inquiry in the biological sciences. To acquire a solid foundation in biology, we developed learning objectives for our lower division majors core based on a set of principles that our majors should fulfill. Our upper division curriculum is centered on all majors having a solid breadth of biology and we developed learning objectives for upper division core in the areas of 1) Organismal Biology, 2) Physiology, 3) Molecular Cell Biology, and 4) Ecology and Evolution. The concentrations within the B.A. and B.S., and the degrees themselves, build upon the foundational skills and information provided in the lower division and upper division cores, and provides our students a solid start on a path of lifelong learning and success.

Assessment: We undertake continuous evaluation of our students in course embedded assessment mechanisms. In addition to evaluations through regular examinations, we query student achievement through written student assessment reports in capstone research-oriented courses and internships in a manner comparable to working scientists. Job placements and graduate/professional school acceptance continues to be an important assessment tool. We are still developing means of program-wide assessment tools. Currently we employ regular faculty retreats and graduating student surveys for assessments and make appropriate changes in pedagogy, curriculum, and advising. We anticipate adding alumni surveys to better assess long-term outcomes of the program.

Department Self Study: The Department was engaged in a Self Study through several faculty mini retreats and department meetings. From this, we recognized that our single greatest concern is the growing conflict between demand by students to major in biology and the faculty’s commitment to delivering a balanced curriculum. Furthermore, the current fiscal challenges place an additional toll on our ability to maintain the
level of excellence the department has developed over time and on timely graduation of our majors. We recognize two major sets of problems: A) the structure and offering of the curriculum, and, B) staffing.

A1. In the lower division curriculum, budget cutbacks have resulted in offering reduced sections of biology majors’ courses along with reduced sections in supporting departments. This situation creates a bottleneck in the lower division preventing students from making timely transit into the upper division curriculum for normal degree progress. Additionally, we find preparation of students as they transit into the upper division not up to the expectations of the faculty.

A2. In the upper division curriculum, we struggle to offer even the minimum required courses for our concentrations in the B.A. and B.S paths. This is typically related to 1) the lack of sufficient tenure-track FTEs and 2) faculty serving administrative functions that provide reassigned time, but not having them replaced with lecturers as budgets continue to shrink (see B1 below). One clearly identified aspect of our program that was also raised by our external reviewer for the graduate program is that the major may be too unit heavy, especially in the upper division. Finally, our supervisory courses through which we offer cumulative research experiences for the majors require significant time commitments from the faculty, yet we do not receive sufficient workload compensation for these efforts.

B1. Faculty receive reassigned time when appointed to serve on University [governance] committees, or are awarded earned sabbaticals, or buy out time from external grants/contracts. However, the Department does not currently receive full replacement costs for these faculty. This stretches the faculty beyond the capacity to deliver the curriculum required for students to graduate on time.

B2. As faculty retire or resign and are not replaced, the full time faculty positions in the Department are running at a significant deficit in the face of ever-increasing majors. The main area where this is especially acute is in molecular and cell biology, which leads to a greater reduction in course offering in this area of the curriculum.

Separate but equally problematic concerns reside with insufficient institutional support for new faculty start-up funds, making it extremely difficult to attract high quality, research active faculty. Second is the lack of equipment purchase and maintenance support to the Department. Finally, the reduction of ‘non-essential’ travel in the CSU system prevents our faculty from holding system-wide meeting with our colleagues to discuss and work towards solutions of common problems and develop new initiatives.

External Review: The Undergraduate Program was evaluated by Dr. Richard Grosberg, Professor of Evolutionary Biology and Ecology, University of California, Davis. Dr. Grosberg’s evaluation included review of the Self Study document and meetings with nearly all faculty members in the Department, staff, several undergraduate students and the Provost. At the conclusion of his review, Dr. Grosberg submitted a detailed report that reflects many of the concerns of the Department regarding the curriculum and the overall program.

Dr. Grosberg recognized our program as one of the most visible and impressive in the entire CSU system, and well beyond. In his report, Dr. Grosberg noted several “exceptional” aspects of the program, including:

- the quality and collegiality of the faculty,
- concerns about staff workload and morale,
- faculty commitment to maintaining extramurally funded research programs,
- faculty involvement in developing and maintaining a vital, diverse, and accessible curriculum, and
- the incorporation of “discovery-based” learning/training throughout the undergraduate curriculum.

Furthermore, Dr. Grosberg praised the Department as being the most research-oriented unit at SSU while paying serious attention to all aspects of undergraduate education and as having an outstanding reputation for training undergraduates for post-baccalaureate work.

Dr. Grosberg’s review raised a number of serious concerns for the program, arising from external forces. He unequivocally identified lack of adequate institutional support as the main threat to our program in its ability
to deliver a balanced curriculum. The problems identified include issues related to the curriculum, faculty, staff and students. Along with these, Dr. Grosberg made many valuable suggestions and recommendations.

- Limited institutional support for with respect to positions and course budgets is taking its toll on the faculty, staff and students. Recommendations included:
  o the faculty should consider changes in the upper-division curriculum that could reduce the diversity and number of requirements for both B.A. and B.S. degrees;
  o reduce the number of concentrations for B.A. and B.S.;
  o give students more flexibility for electives to fulfill requirements of areas of concentrations;
  o the administration should analyze the strengths and weaknesses of calculating WTU and address inequities of the system.

- The department is lagging behind other comparable institutions in the CSU system in its capacity to deliver instruction in molecular biology and genetics, genomics, and bioinformatics. Recommendations included:
  o the Department should develop a recruitment plan that identifies its curricular and scholarly strengths and weaknesses, and that specifies how and why these positions would be transformative;
  o the program would greatly benefit by adding at least two positions in the areas of molecular biology, molecular genetics, genomics, and/or bioinformatics;
  o the Administration should provide adequate resources for start-up packages for new positions.

- The Administration should increase support for instructional equipment and supplies, both in terms of direct allocations and overhead/indirect cost returns. Recommendations included:
  o the faculty should develop a prioritized list for equipment and maintenance needs;
  o the administration must provide substantial funding to the department to maintain existing equipment and to acquire critical new equipment for teaching labs;
  o the administration should immediately begin a practice of returning a substantial fraction of indirect costs that originate from grants awarded to faculty in the Department;
  o the faculty should continue their already successful efforts to seek extramural sources of support for the development of instructional infrastructure.

- The static salary structure, combined with limited or no opportunities for merit, provides the staff few incentives for improving productivity and expanding skills. In addition, the staff faces serious impediments to their job performance and there is a lack of personnel support for undergraduate lab development and implementation. Recommendations included:
  o the Administration should prioritize re-instituting the merit and promotion systems for University staff as well as a professional development plan;
  o the Administration should immediately begin a comprehensive review of its accounting practices;
  o the Administration and Department should work collaboratively to resolve support staffing issues, e.g. hire a full time staff member to develop an implement laboratory curriculum.

**Action Items:**
- Continue to strengthen our program by fostering a climate of excellence in teaching and scholarship.
- Assess the efficacy of, and revise as required, the lower division curriculum to ensure that students are fully prepared for the upper division course work.
- Revise the upper division curriculum to a simpler structure, with fewer concentrations and more flexible requirements.
• Continue faculty efforts to seek extramural sources of support for research and development of instructional infrastructure, and increase administrative support in these efforts to obtain and implement awards.

• Working with the Administration, develop a plan for recruiting new tenure track faculty members in disciplines such as molecular cell biology, genetics and bioinformatics.

• Develop a tenure track faculty recruitment plan that identifies the Department’s curricular and scholarly strengths and weaknesses, and that specifies how and why these new positions would be transformative.

• Advocate for increased, sustainable funding to the department to maintain existing equipment and to acquire critical new equipment for teaching labs.

• Advocate for direct replacement of reassigned, sabbatical or buy out time for faculty.

• Develop specific strategies and opportunities for student and faculty research and professional development to support the Department’s mission and curriculum.

• Working with the Administration, analyze the strengths and weaknesses of the current method for calculating faculty workload and propose a solution to the imbalance between workload assignment and expectations for teaching, scholarship, and service.

• Develop a staffing plan that addresses the competing needs of accounting, academic planning and advising, maintenance, and lab coordination so that duties and expectations are clearly defined.

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