

Précis

Program Performance Review

Chemistry and Biochemistry, BA, BS, MS

College of Natural Sciences and Mathematics

Maria Linder, PhD Chair

MH 141

January 15, 2010

3:00PM-4:00PM

Background

The Department of Chemistry and Biochemistry conducted a program performance review during the 2008-09 academic year. A self-study was completed and a Visiting Team of evaluators viewed the self-study, other documents including undergraduate and graduate handbooks and advisement sheets. The Visiting Team also interviewed the College Dean, faculty, staff and students. Team members included: Pete Palmer, Professor Department of Chemistry and Biochemistry, San Francisco State University, Cynthia Larive, Professor Department of Chemistry, University of California Riverside, Jack Bedell, Acting Chair, Department of Anthropology, CSU Fullerton and Victoria Costa, Director, Science Education Programs, CSU Fullerton. The team issued a report of its findings which included recommendations. Also, the dean provided a summary and recommendations and the chair of the department responded in writing to the team report. The self-study was well-written and responsive to the guidelines which emphasize analysis of data and planning.

Key Data

The Department of Chemistry and Biochemistry continues to flourish as a significant academic unit in the University and the college of Natural Sciences and Mathematics. Demand for both graduate and undergraduate courses has increased by 60% in FTES since the last review; the department attributes this increase to the demand for major and service courses. In 2003-04 the FTES was 328 in 2007-08 the number was 468. Most undergraduates enroll in the BS in Chemistry –Biochemistry program 2008-09 headcount 261 in BS Chemistry 67 and fewest in BA Chemistry 18 headcount. The BS programs have grown in the last five years while the BA program has actually seen a slight decline from 25 headcount in 2004-05 to 12 in 2008-09. Most majors require 6 years to graduate(40-50% for those entering as freshmen and 60%-80% for upper division transfers) The program sees high attrition it is believed that many of these “initially-declared” majors go to other departments especially Biology. Graduate student enrollment has not changed appreciably over the years. Annualized headcounts have varied from 37.5 to 51 and graduate student FTES around 12. More stringent admissions requirements have an impact on graduate enrollments. The faculty has been beset with retirements and various attrition issues. In 2002 there were 18 tenured and tenure track professors in fall of 2009 that

number is down to 16. The department plans to conduct a search for a tenure track faculty member fall 2009. So many retirements and attritions has left the department in a difficult position for succession planning as there are fewer mid level faculty members.

Key Issues

While the visiting team commends the department as being well regarded amongst its peers, for example the mandatory student-faculty research component of the curriculum is noteworthy there are nonetheless issues that need to be addressed. The department should take steps to reduce faculty workloads. The department should consider reviewing the curriculum with the intent of decreasing the time required to complete both bachelors and masters degrees. Like many departments but especially those in the “hard disciplines” there is a need to explore ways to increase graduation rates. A key issue for the department is to review its retention, tenure and promotion policies. The department has made progress in developing an environment for the assessment of student learning including development of indicators of departmental quality, more needs to be done. (See outcomes assessment discussed below). The Visiting Team noted that for any number of reasons a “morale” problem exists in the department particularly among faculty. How will the department address issues of morale in the current economic climate? And a related question how can the department maintain the quality of its programs and sustain them in the present economic climate?

Outcomes Assessment

The department of Chemistry and Biochemistry has developed a strong foundation in the assessment of student learning outcomes and the articulation of quality indicators for departmental effectiveness. Student learning goals and outcomes have been established along with assessment measures and strategies. Learning goals include *Concepts, Skills and Processes*, and *Attitudes* and provide the context for learning outcomes. A table in the self-study illustrates the learning goals and outcomes with corresponding assessment strategies and measures. Of note is the capstone experience for majors. The capstone experience includes research, written and oral reports evaluated by faculty outside of the mentor’s laboratory. Importantly, the department has identified quality indicators as a gauge for overall departmental effectiveness/success for example, publications with student co-authors in peer reviewed journals and as published conference presentations (including abstracts) is cited as a measure of success. The department should consider adding to the list of indicators, that might include graduation rates, graduate/professional school enrollment rates. Having set the foundation the department is now ready to take the next and arguably the most important aspect of assessment – to use information/data for enhancement and improvement – in teaching and learning and overall departmental effectiveness.

Outlook

The Visiting Team noted that the department of Chemistry and Biochemistry has a reputation of excellence in teaching and research across the CSU system. The department has been identified as having a committed, dedicated and hardworking faculty despite large numbers of retirements and other attrition and heavy teaching loads. The faculty are actively engaged in research, grant procurement and service to the University and broader professional community. A most impressive quality indicator for the department is its goal of creating a “research culture” in the department. This is seen in student-faculty research – all undergraduate majors are required to participate in a research experience with a faculty mentor. As a result in the last 7 years there have been 90 peer reviewed articles co-authored with faculty and students. In addition, faculty and students have made more than 200 research presentations at regional, national and international conferences and hundreds of research presentations at local and CSU conferences. Enrollments in the department are robust and expanding and student surveys show students are pleased with teaching and faculty mentoring. Nevertheless, the department faces challenges to maintain and sustain its reputation as a department with quality and cutting edge programs. Such challenges include faculty workloads and an aging infrastructure. It appears that the department has effectively used the program performance review process to begin to plan and chart a course to meet these challenges both short term and long term. Evidence of this is seen in the development of department priorities which for example, include redesigning and rethinking the BS Biochemistry degree so that it has more elective units and strengthen guidelines for the capstone research experience to make it more explicit and more amenable to assessment.

Gerald W. Patton

Director of Assessment and Educational Effectiveness