

Program Review Self-Study Proposal for the Department of Chemistry
California State University, Sacramento
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Introduction. The Department of Chemistry is a relatively young department with the vast majority of the faculty at the rank of assistant professor or newly tenured associate professor. We currently only have three full professors in the department, two of which are in the FERP program (one ends Spring 08). As a result, the department profile looks very different than during the last program review. In considering the program review options provided by the Program Review Pilot Study, our department has concluded that a hybrid of Option C (Focused Inquiry) and Option A (Current Self-Study Guidelines) would benefit the department most at this stage.

We propose the following Self-Study Format:

I. General Information about the chemistry programs including statements pertaining to the departmental changes since the last review.

- a) Data on faculty
- b) Data on students
- c) Data on staff
- d) Data on programs
- e) Data on courses

II. Responses. The review will respond to the to recommendations from last program review.

III. Retention. The chemistry department has spent considerable energy examining retention issues. In this pursuit, during the 2006-2007 academic year we established a departmental ad hoc "recruitment and retention committee" to study these issues and to identify potential improvement strategies for the recruitment and retention of science majors. Central to the retention issue is the fact that the greatest loss of students occurs in the first or second year of their academic career. This time coincides with the student's enrollment in the general chemistry sequence (CHEM 4, CHEM 1A and CHEM 1B), courses with 50% D,W,F statistics. We believe that poor student performance in these courses is directly related to the attrition of chemistry majors and science students in general. Focusing upon the goal to improve student retention and graduation rates in the sciences, we have been

- a) working to develop a fuller understanding regarding the high D/ W / F rates in the general chemistry series.
- b) implementing modified advising requirements for students entering academic probation status.
- c) making course modifications to facilitate student learning and retention including a greater incorporation of online resources, increased diagnostic screening, and pre-requisite modifications.
- d) participating in the "Transforming Course Design" initiative out of the Chancellor's Office.

We will provide a summary of our retention studies, a copy of our newly developed retention plan, and full descriptions of related activities and future plans.

IV. Assessment. The current chemistry department assessment plan was largely developed prior to the significant faculty turnover due to retirements. Faculty, courses, and program goals have changed significantly during this time. Additionally, the American Chemical Society (our certifying agency) has recently (Spring '08) modified the accrediting guidelines and evaluation procedures for our undergraduate BS program. As a result, we have been re-examining the existing department assessment plan to evaluate its suitability applied to current programmatic goals. Each subspecialty in the chemistry department has been examining and in some cases modifying the learning goals and assessment practices in their associated programs. We are paying particular attention to the development and implementation of appropriate and sustainable assessment tools. Additionally, we are developing assessment plans for our MS degree in chemistry and biochemistry graduate programs. Our self-study will provide current assessment plans and available assessment data.

V. Facilities / Resources/ Budget. Chemistry is an experimentally based discipline that is founded upon making sophisticated measurements in order to formulate a full understanding of the molecular systems that make up the world in which we live. In order to prepare high quality chemistry graduates who will be able to enter the technology workforce, graduate school, or professional school (medicine, dentistry, pharmacy, and others), our courses require a significant proportion of "hands-on" experience in making these intricate measurements. These experiences can not be effectively replaced by "dry-lab" experiences since students will need to actually perform these skills in their future endeavors. Employers and graduate schools expect graduates to have considerable lab experience and to be familiar with the operation of **modern** chemical/biochemical instrumentation, techniques, and analysis methods. In addition to our majors, other departments such as engineering, biology, nursing, kinesiology, and environmental studies also depend upon our courses to provide these important and necessary skills to their majors. The expendables, equipment, and major instrumentation required to provide these critical student activities are expensive. Subject to inflation, these are currently showing a significant increase in cost. Coinciding with the increasing costs are decreasing budgets and a greater demand for our experimentally based courses due to the attention being placed upon the STEM disciplines and pre-health professional majors. The chemistry department has recently increased lecture and laboratory section size in some courses as an attempt to meet student demand. The larger sections will require course restructuring in order to accommodate the increase student population in the room. Some of these changes are projected to have potential negative pedagogical consequences. A larger student to faculty ratio in terms of teaching and advising will certainly increase the percentage of faculty time spent on course related activities and decrease the available time to mentor the student research and personalized advising activities that are two of the strongest elements defining our current programs. The chemistry department is very concerned with its ability to continue to serve students with a high quality program in a climate of declining budgets. In fact, we project an inability to meet the demand of students requiring our laboratory courses for graduation due to the likelihood of budget induced laboratory course section reduction. We will provide an analysis of our current facilities, equipment, laboratory offerings and structure, and human resource issues. Potential strategies to mitigate the negative impacts will be included. The goal of the analysis is to serve as a comparison point for the next review cycle which we anticipate may show budget induced deterioration in some of these areas.