

Comprehensive Program Review (CPR)
Follow-up Report on the continuous improvement of
the B.S. program in Chemistry

December 3th, 2007

Submitted by the Department of Chemistry and
Biochemistry

Prepared by
Dr. Martina Kaledin
Dr. Scott Lewis

I. Evidence of quality enhancement of the program since 2003

Since 2002, the faculty has grown from 9 to 22 full-time members. Additionally 10 part-time faculty are also employed who typically teach lower division chemistry courses. The faculty with strong teaching skills and applied research interests have gained nationwide recognition for the success of our graduates. Within the last few years, the increased focus on research have brought about a higher expectation for faculty scholarship. With support of KSU and external funds we have built up our research capability while maintained the teaching mission. Engagement of our undergraduate students into the research activities is a major factor in the quality enhancement of our program. Our students meet the entrance requirements of most graduate and professional schools with a biology or chemistry degree. Also since 2003 members of the faculty have been principal investigators on eleven funded grants totaling just under \$900,000, which among other goals, provides additional opportunities for undergraduate research and scholarships for undergraduates.

II. Evidence of productivity enhancement of the program since 2003

The department has experienced exceptional enrollment growth since 2002, 161 students in 5-years which is about 70%.

Chemistry declared majors

2002	2003	2004	2005	2006	5-year change	5-year % change
229	298	363	359	390	161	70

Chemistry graduates

2002	2003	2004	2005	2006
13	9	15	27	17

As of spring 2007, 342 students have declared major in chemistry and 25 additional students have declared a major in chemical education. These numbers indicate improvement in the productivity of the program as many of these students proceed through the degree program. Additionally the number of chemistry graduates from the program has shown a general increase over the same time period. Enrollment growth and new investments in research in the Department of Chemistry and Biochemistry are expected to result in a substantial increase in the number of students who anticipate advanced training (professional or graduate schools) and research careers.

III. Action plans and priorities from the 2003 Follow-up report that have been accomplished

A. Changes in the chemistry program

Major changes in the chemistry program include removing of courses CHEM 3990, Seminar, and CHEM 1110, Chemistry Career Seminar. The course CHEM 3000, Chemical Literature, has changed number of credit hours to 3. Originally this Chemistry Literature course served chemistry students enrolled in the professional track. Now more students are enrolled in this class due to increased interest in the research projects. This course explores the process and practice of chemical research that leads to publication. It introduces students to resources and methods for searching the chemical literature and substantially improves the quality of undergraduate research outcomes resulting in presentations in local and national meeting and written research reports and publications. We have also created additional courses to better address the diversity of tracks offered by the chemistry program. For example, CHEM 3120, Descriptive Inorganic Chemistry, was created to provide inorganic chemistry in a manner directed to the general chemistry and chemistry education track, freeing CHEM 3110, Bioinorganic Chemistry to direct content specifically for biochemistry majors. We have also created a CHEM 3800, Forensic Analytical Chemistry, to combine forensic chemistry with modern analytical techniques for our forensic chemistry majors.

B. Retention and recruitment

Retention is very important for the chemistry program. Therefore faculty actively work on improvement of the retention rates by organizing advising sessions every semester. Also faculty are engaged in the one-to-one advising sessions to help students take the correct courses in the correct sequence. Other activities that promote improving relationship between faculty and students are “fireside meeting” among all the women faculty and women chemistry, and work of the student organizations SACS.

IV. Action plans and priorities from the 2003 Follow-up report that need to be addressed and proposed timeline for their completion

The department is considering several options to improve the graduation rates within the program. First we are considering a mandatory advising session for freshman students or those who recently enter our program. These advising sessions would be geared toward ensuring students take the correct number of classes from the beginning in order for them to graduate in a timely fashion. Second, there is also consideration of adding a Calculus II requirement to more tracks in our program. The background students receive in this class should assist them with more math intensive courses later in the curriculum such as Physical Chemistry. Finally we are also considering having a department picnic or other activity to promote a congenial relationship between faculty in the department and students. Such a relationship may make students feel less intimidated in seeking out an advisor. Additionally efforts are being made to understand and improve factors that relate to student retention in our general chemistry program.

V. Current status of the program’s viability

a) The B.S. Degree in Chemistry was deemed viable in the 2001-2002 Report. Given the current state of the Program which, when combined with the new Biochemistry Degree Program, is the largest of its kind in the entire University System of Georgia, the Program continues to be very healthy. The Program has more than doubled in majors since the time of the 2001-2002 Report and the number of graduates has increased accordingly.

With respect to KSU's Strategic Plan, the Chemistry program advances the specific goals and action plans in many ways.

- Goal 1: To enhance and expand academic programs and delivery.
 - Chemistry is expanding its program to include an MAT program for Chemistry Education majors who will serve the local community and beyond. (Action Step 8). Qualified secondary level chemistry teachers are in great demand, and this increase in both undergraduate and graduate programs is in line with the above-stated goal
 - Programs have been proposed for overseas collaborations and/or courses but are still in planning stages due to lack of resources (Action Step 2).
- Goal 2: To improve retention, progression, and graduation rates while maintaining high quality
 - Specific advisement protocols are being implemented (Action Step 1)
 - Schedule of courses for 2007-2010 is published on Chemistry's home page (Action Step 4)
 - Implemented a supplemental instructional lab in the Library (Action Step 7)
 - Many courses now use American Chemical Society standardized exams as assessment tools of teaching and learning (Action Step 3)
- Goal 3: To expand campus resources and enhance campus infrastructure
 - Plans to build a new laboratory wing are in place for FY 2009 (Action Step 1)
 - Chemistry faculty members have submitted several grant proposals and have been successful in attaining funding in excess of one million dollars to date (Action Step 9)
- Goal 4: To enhance student life activities and prepare students to be leaders
 - Two major Chemistry clubs (Student Affiliates of the American Chemical Society and Phi Lambda Upsilon) are engaged in community service (Action Step 1)
 - Many Chemistry majors are involved in both cooperative and internship programs. Due to the positive results employers have had with these majors, there is starting to be an increase in demand for more (Action Step 4).

b) In order for Chemistry to further the KSU's Quality Enhancement Plan related to global learning, there needs to be greater institutional support especially with respect to student travel. Many proposed programs today have a hefty financial commitment with regard to overseas travel, and this is a potential stumbling block to student participation. The same is true for faculty participation. Travel scholarships and subsidy needs to be available if we hope to engage our students in learning experiences outside of the United States.

c) Currently there are no plans to offer any Chemistry courses off campus. Based on past experience, it is better to devote resources to on campus delivery rather than compete in online or other off campus venues.

d) The Chemistry program is in the process of being refined, but the principal needs now are space and manpower. The infrastructure has not kept pace of the meteoric growth since 2001 which also includes the new Biochemistry Degree Program that brings the combined total majors to over 600. The need for more space and concomitant equipment is critical. This should be met with the building of the new laboratory wing in 2009 and also the new Heath Science Building in 2008.

The faculty has grown from nine full time tenure track members in 2001 to sixteen with two of those being lecturers. Action Step 1 of Goal 1 in KSU's Strategic Plan is to reduce student faculty ratio from 27:1 to 25:1. Based on calendar year 2007 figures alone, the average ratio was 29:1. There is a clear need for more tenure track lines in the Chemistry Program which shares faculty with the Biochemistry Degree Program.