Chemistry Program 2006 Assessment Review

1. **What evidence do you have that students achieve your stated learning outcomes?**

As we have only been collecting data for one semester our data is somewhat incomplete. However, we do have the following data that we evaluated.

A. The Department was re-accredited by the American Chemical Society for another five-year span. We are in the process of providing comments to the ACS Committee on Professional Training, who are updating the requirements to be accredited.

B. Facilities Committee Report:
   
   We have acquired 3 more instruments over the last year that students in our program did not have access to before; Inductively Coupled Plasma Atomic Emission Spectrometer, Fast Gas Chromatograph, and a Karl Fisher titrator. Furthermore, Dr Li submitted a $300,000 grant to the National Science foundation to update another of our instruments, a Nuclear Magnetic Resonance Spectrometer. We were also able to purchase a second Ultraviolet-Visible instrument to allow more than one laboratory section access to this core piece of equipment at the same time.

C. We discussed our program goals with our College Industrial Advisory Board representatives and these goals are in line with what is expected from industry.

D. The following classes have performed at or above the national average for the American Chemical Society standardized exams, Chemistry 1240 (Freshman level), Chemistry 2150 (Sophomore level), Chemistry 3540 (Junior level), and Chemistry 4240 (Senior level). These were the only classes that gave national standardized exams during this period.

E. We are meeting the needs of the students who take Chemistry for Engineers, Chemistry 1450. These students achieved an average just below the national average last fall, 38 versus 42 correct answers. As the exam was developed for a two semester general chemistry sequence and our engineers take only one semester, this is a substantial accomplishment. This score is a little lower than previous years, but hopefully this is just an anomaly. Engineering students are also doing well on the chemistry portion of the Fundamentals of Engineering exam. (exact numbers are not available at this time)

F. Student Resumes were collected for all juniors and seniors enrolled in Chemistry 4060, Chemistry Seminar. We had a recruiter from Sigma Aldrich Fine Chemicals located in Madison, Wisconsin evaluate and commented on a random twenty percent of these resumes. Based upon these comments both the students and chemistry faculty are more informed about what information to include and how to present this information in a resume. All of these students were later phone interviewed by the company.
2. **What have you learned as a result?**

   A. We need to encourage faculty to submit their data from specific courses directly following their finals. There were two faculty who did not provide their results to the program’s assessment committee in a timely manner. One was on sabbatical.

   B. We are still in the process of developing a number of the tools that will be used to assess our entire program.
      i. Exit survey (to be performed this spring for the first time)
      ii. Senior Exam (being developed by the American Chemical Society Exam committee)
      iii. Graduate Survey (will be updated on a yearly basis)
      iv. Course Files (preliminary report has been completed)
      v. Faculty Survey for other programs on campus (has not been developed yet)

3. **What, if any, changes will you make in order to improve student learning?**

   A. We will continue to broaden and modernize the Program’s instrument holdings in order to keep our graduates as current as possible with current laboratory and instrumental techniques.

   B. We will still keep a “core” set of instruments that every student should be “competent” in. These will include Fourier Transform Infrared Spectroscopy, Ultraviolet – Visible Spectroscopy, Gas Chromatography, and Nuclear Magnetic Resonance Spectrometry. We will do this by having the students perform a minimum of one laboratory on each of these instruments in at least three different courses before graduation.

   C. We will continue to develop the tools described in our Assessment Statement.

   D. We are performing as well or better than the national average on the American Chemical Society exams that are given. We are, therefore, meeting the desired level of knowledge of chemical concepts expected of undergraduate students at the present time. We will seek out tools for the courses that have not been assessed as well as a more appropriate tool for Chemistry 1450, Chemistry for Engineers.

   E. We need to determine how to get better feedback from the Alumni Survey tool or develop a more efficient instrument for post-graduate assessment. The Engineering, Mathematics, and Science College is working on this as well since the college as a whole has less than a 20% response rate. We will work closer with the College survey and also with the Associate Dean to obtain the Fundamentals of Engineering exam results for graduating engineers.