Weber State University

Response to External Review Document

Department of Chemistry
College of Science

May 7, 2008

Introduction

The WSU Chemistry Department would like thank the external Review Team for their dedication and professional review of the Chemistry Department at Weber State University. The strengths and weaknesses of the Chemistry Program as described in the External Review document were formulated after a site visit and interviews with students and faculty. Successes and shortcomings of the program were elucidated. This response provides additional information regarding these strengths and weaknesses and presents some possible solutions to strengthen the program.

A - Mission Statement

It is expected that Chemistry will remain largely a service department for other programs and majors, in view of its central importance in the physical, life, and health sciences and other areas. The number of Chemistry majors is not expected to change dramatically in the near future. Some of the Department faculty will likely continue to develop opportunities for online

and continuing education courses that offer a route to improve their standard of living via teaching extra loads. Others are authoring textbooks and educational materials, while some are involved with chemical technology in businesses.

B - Curriculum

The Chemistry curriculum will undergo a period of discussion and change as the Department applies for renewal for certification under new American Chemical Society (ACS) guidelines (2008). At least two new sophomore level courses will be needed – inorganic and physical chemistry. We anticipate much discussion of these issues next year. Changes may be needed in the summer course offerings in order to deal with recent declining demand. That the Chemistry minor requires no upper division credit is good point, and will also be brought up next year. Adding Analytical Chemistry (Chem 3000) and its prerequisite Computer Applications (Chem 3020), to the minor requirements would be logical additions. This might improve small enrollments in these courses, and would also add credibility to BIS degree recipients. Several students choose chemistry every year as one of their BIS emphases, for which the requirements are the same as the chemistry minor.

The Review Committee recognized the "real challenge" of requiring two credit hours of Independent Research and Study (Chem 4800) of all future chemistry graduates (beginning with those who were freshmen fall semester, 2007). The Department concurs with the Committee's findings, and this is a foremost concern. The issues were described in the full review, and are summarized in three points: (1) finding funding for modern, sophisticated research instruments and their ongoing maintenance, (2) providing adequate faculty time and incentives to accomplish research and professional development, and (3) having the proper types of facilities and laboratory spaces set up for several branches of undergraduate chemical research – analytical, biochemical, inorganic, organic, physical, etc. Raising laboratory fees might be discussed next year as a means of acquiring additional funding, but University policy, that funds must be expended for the courses from which they are collected, severely limits the use of these funds for large instrumentation support. Student laboratory fee money, even if double the amount now collected, is not a reliable or adequate solution for funding research quality instrumentation. Undergraduate chemistry research is largely in a "chicken and egg" situation. If the University can find ways to better address the three points above, the Department publication record should begin to improve, which would subsequently aid grant writing to become more productive and successful. The Chemistry Department has been requesting an instrument maintenance staff member over twenty years, but to date the need for this position has not been taken seriously by the Dean or administrators. Instrumentation in the CTC is mostly useful for bioanalytical work, but the instruments are available to faculty and undergraduate students with the Director's supervision and approval.

C - Student Learning Outcomes and Assessment

Administering ACS National Exams for courses besides organic chemistry will be discussed again next year. Students are required to write a formal paper on their research for Chem 4800. They will also be presenting their research results in the Senior Seminar (Chem 4990, one credit hour) which is required for graduation and accompanies Chem 4800. Instructors will grade papers and presentations by similar means and standards established in

other courses.

D – Academic Advising

Many of the suggestions made in this section have already been implemented. Incorporating some additional advising in Chem 1010 and 1200 as a recruiting tool is a good idea.

E - Faculty

Faculty presently receive only half teaching credit for laboratory courses. The new ACS teaching limit guidelines are based on actual clock contact hours, (maximum 15 per week). Our traditional teaching loads are now over this limit in most cases. Undergraduate teaching assistants have been more extensively used than ever before in the laboratory courses during the past five years. Their use is restricted by the hourly student budget. Even the best undergraduate teaching assistants (TA's) are inexperienced compared to good graduate students. Department policy is to cover all laboratory courses with a Ph.D. or occasionally a master's degree instructor, who simultaneously supervises a TA. TA's help with some of the grading, but it is unlikely that undergraduate TA use will ever liberate very much additional faculty time.

University and College requirements for tenure, without adequate internal support, place some junior faculty members in a very precarious situation. Little startup money is available, and the Department has few formal means of addressing junior faculty needs. Many have little choice except to teach overload courses in order to support their families. This impacts their time and ability to initiate and perform research. Mechanisms for recognizing student research efforts are puny and unrealistic at the present time (one quarter teaching credit hour per student credit hour).

The Review Committee noted that the Chemistry Department does not seem to have the respect of the College in the tenure process. The College Committee sometimes seems to overlook and overrule Department Promotion and Tenure ratings and judgments, rather than to leave ratings to those who know the candidates and discipline best. Although checks and balances are appropriate within the system, the College Committee should perhaps be changed such that each Department has a representative on the committee at all times. The Chemistry Department has been represented on the College Tenure and Promotion Committee for the past three or four years. The Chair has met and discussed issues with junior faculty since the last tenure and promotion review. In one case, scheduling was adjusted to hopefully allow the candidate to more successfully progress.

F - Program Support

An instrument engineer / technician has been needed for many years. Obtaining access to Sci-Finder Scholar appears to be an excellent suggestion, funding permitting. Increasing student laboratory fees will be discussed next year.

G - Relationships with External Communities

Outreach activities are expected to continue. The Chemistry Department website can be

found from a link in the Weber State homepage index. The Department is in the process of establishing a link to an interactive chemistry alumni web page, that can be updated by the user. This will hopefully help us track our chemistry graduates better.

H - Program Summary

Although progress ongoing in some subdisciplines, undergraduate chemical research at Weber State is still in its infancy compared to large research universities, and many challenges will have to be surmounted in coming years. Most of these challenges are related to the scarcity of resources.