Date: July 12, 2010

To: Tracy Pellett
Associate Vice President for Undergraduate Studies

From: Kirk Johnson
Dean, College of the Sciences

Subject: 2009-2010 Program Review, Chemistry

You have asked me to provide commendations and recommendations as part of the program review process for the Chemistry Department. These observations consider the self- study, the external evaluator's report, as well as on the context and resource issues with the college.

The department prepared a self-study and hosted the campus visit of the external reviewer. Dr. David Cleary provided a focused set of recommendations in his report. My commendations and recommendations closely follow his.

COMMENDATIONS:

The external reviewer notes several critical department strengths:

- Chemistry faculty members have embraced a department culture that is student-centered. The engagement of both undergraduate and graduate students in the department is one of its major strengths. The value department members place on student/faculty interaction is evident in the consistently high frequency with which undergraduate and graduate students are involved in research projects and in the level of student praise for faculty accessibility.
- The department offers a collegial working environment for its faculty and students. This cooperative or supportive environment is reflected in department decision making processes, an active faculty mentoring program, integration and collaboration with Science Education, and through the sharing of laboratory space and equipment.
- Department philosophy and practice reflects the teacher/scholar model. The department's SEOI scores and graduate survey results attest to the quality of instruction provided by the department, and the faculty are actively engaged in scholarship as evidenced by the department's overall rate of publications, conference presentations and an increasing level of grant applications/awards.
- The department has developed a credible programmatic assessment plan. Moreover, assessment-based findings are beginning to be placed into practice by the department (in light of both the student and the external reviewer's comments regarding CHEM 181).

- Finally it should be noted that external reviewer's perceptions of the overall lack of university-wide safety monitoring does not apply to the excellent job the department's safety officer, Cynthia Kuhlken, had been doing prior to her retirement last month. Training protocols for students and faculty and operational procedures under her had been excellent.

RECOMMENDATIONS:

The external reviewer identifies several issues that require planning or support. The following recommendations reflect the issues identified in the report.

- *Undergraduate Curriculum Rigor and Integrity:* The external reviewer's findings and the results from student SEOI surveys suggest attention is needed in the coordination of CHEM 181 and its labs. While the shared labs create efficiencies, students report the lectures and labs sometimes are out of sequence with one another. That is, when multiple faculty offer lecture sections of CHEM 181 there is a tendency for some lecture sections to fall behind the material covered in laboratory exercises. This can present disadvantages for students who are not prepared to participate in the lab, as well as for the faculty member and students who supervise the lab sections. It is recommended that the department continue its efforts to ensure greater coordination of this course and its labs. Students also report difficulty in meeting the expectations and rigor in upper-division courses when they move 100 level courses to a 300 level courses without a transitional 200 level course. The department should consider whether it could institute at least one 200 level course in its sequence to assist students in this transition.
- *Undergraduates Leading Student Labs:* the external reviewer notes that there is an increased risk of injury and financial liability when utilizing undergraduate students to supervise students in the labs. I would encourage to department to discuss his concerns and to devise a plan to transition this work assignment to graduate students or faculty.
- *Undergraduate Curriculum Planning:* The department should initiate or revitalize direct lines of communication with departments for which it either provides a service course or when chemistry is the consumer of a service course (e.g., chemistry offers prerequisites for geology and biology, and mathematics offers prerequisites for chemistry). This might assist the department in determining how many course sections it needs to offer from one year to the next and reduce course scheduling conflicts for students. In addition, faculty and students report that students without the requisite background in mathematics struggle to meet the expectations for chemistry coursework; this lack of preparation contributes to a higher than average course withdrawal and course failure rates in lower-division chemistry courses compared to university averages. What appears to be a chemistry problem (higher than average failure and withdrawal rates) is in actuality a problem located in student preparation to enter chemistry courses (prerequisite skills). The external reviewer suggests working with the Mathematics Department to construct screening tools which might be used to identify those who might be prone to such challenges. Perhaps voluntary

group advisement on the need for prerequisite work in mathematics would also better prepare students for the challenges of chemistry courses.

- *Timely Curricular Feedback:* Some students reported delays in receiving feedback on assignments. The department might remind faculty of the importance of providing relevant feedback in a timely fashion.
- *Computer facilities:* Students voiced concerns over available computer lab times and with the lack of up-to-date software in some computers. If this isn't already being done the department should consider clearly posting the hours the labs would be used by classes and ensure that all public access computers in Science Phase I are equipped with essential software.
- *Role and Scope of the Graduate Program:* Although enrolment has improved of late, demand for the graduate program continues to be quite small. A majority of students still come from the department's undergraduate program and graduate student morale appears to be suffering due to the combined effects of a paucity of available graduate course offerings and low financial support. While small graduate stipends and a lack of tuition waivers and scholarship funding undoubtedly play a role in the graduate program's status, the department must accept greater responsibility for its failure to thrive. The external reviewer offers suggestions on how to revitalize the graduate program; these include changing the focus/direction of the current program and engaging in a heightened public relations/visibility effort in order to attract more students.
- *Student Assistants, Equipment Repair and Replacement*: The department should continue to work with the university and college to acquire a revenue stream to maintain and replace equipment and to staff labs. Given the budgetary realities the state faces, it would be prudent to prepare department level plan to meet these critical needs in case they cannot be provided by the college or broader university. This revenue stream may increasingly need to rely on a more robust summer schedule, foundation awards, and grants.

SUMMARY:

In summary, the Chemistry Department has a strong student-centered identity with a well defined disciplinary focus when it comes to its undergraduate mission. The department faculty maintains a strong record of instructional performance and scholarship. However, there is work to be done when it comes to undergraduate curriculum, the mission and scope of the graduate program, and planning for future costs.