PROGRESS REPORT OF THE ACTION PLAN OF THE CHEMISTRY 5-YR PROGRAM REVIEW

by Ben Jang

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Based on the action plan filed on February 6, 2008, the chemistry department is to focus on improving the graduate program while enhancing the undergraduate program to feed into the graduate program. There are 3 objectives in this plan, including (i) reduce the teaching load of faculty to enhance and sustain the quality of teaching, research and service, (ii) implement and grow the 3-yr MS program to improve the enrollments of upper level undergraduate program and graduate program, and (iii) redesign the curriculum and the degree options of the graduate program to better recruit, retain and prepare marketable graduate students. The progress to date is summarized as follows:

(i) Reduce the teaching load of faculty to sustain and enhance quality teaching, research and service.

(a) Offer double numbering courses

The following courses were cross-listed:

Spring 08
Chem 415, Inorganic Chemistry and Chem 531 Advanced Inorganic Chemistry
Chem 441, Instrumental Analysis and Chem 541 Advanced Analytical Chemistry

Fall 08
Chem 351 Physical Chemistry I and Chem 521 Thermodynamics
Chem 497 Instrument Analysis II and Chem 548 Advanced Instrument Analysis II

Spring 09
Chem 415 and Chem 531 (did not make)

While this approach is very effective in reducing the faculty contact hours, the concerns of achieving two sets of learning outcomes are realistic. The department will require the instructors to revise the syllabi to present two sets of approaches to achieve two sets of learning outcomes. One approach for graduate students to have additional learning outcomes is to require graduate students who had taken the cross-listed courses before to teach selected topics of their expertise
for the courses. Teaching is a well known way for learning including communication, presentation and organization skills.

On the other hand, in order to reach the goals of student learning of both undergraduate and graduate courses and reducing teaching load of faculty, it is recommended to eventually separate these courses in the future. There are currently 4.75 teaching faculty (4 full-time faculty + 50% of the Department Head and 25% from the Research Assistant Professor) in the department. It is recommended to have one additional full time faculty in the next 3-5 years to reduce the teaching loading and eventually to 9 contact hours per full-time faculty. One possibility is to have the stockroom manager teach some of the freshman level courses and laboratories with additional GA support for the stockroom. This approach will partially reduce the teaching load of faulty, but will have to wait until the next hire of the stockroom manager with additional qualification in teaching.

(b) Hire an instructor/adjunct to teach service courses.

In Spring 08, Satish Garre (MS in Chemistry from A&M-Commerce) was hired to teach Chem 108 for a semester. No additional adjunct was available to the department in Fall 08 or Spring 09. The department will continue to recruit our own recent graduates with MS degree to serve this capacity. On the other hand, the adjunct resource, in addition to the GA fund, should be available to the chemistry department every semester provided by the office of Dean of A&S.

(ii) Implement and grow the 3-yr MS program to improve the enrollments of the upper level undergraduate program and the graduate program.

The 3-yr MS program is progressing well. Taking advantage of the REU (Research Experience for Undergraduates) program, the department successfully transferred 5 excellent REU students to the chemistry program in Fall 08. Together with two transfers started in Fall 2007, there are seven REU students who are studying full time in the chemistry department. The addition of these students has improved the atmosphere of the department dramatically, partly due to the students’ academic performance and partly due to their commitment to research. Currently, there is one REU student committed to the 3-yr BS-MS program and two others have expressed strong interest in the program. Several are considering their options, but their interest in continuing their study in Chemistry graduate programs has increased significantly based on the discussion at the REU reunion on Feb. 21, 2009.

Due to these REU transfers, the credit hour production of the upper level undergraduate program has increased about 60% in the last two semesters compared to the semesters a year ago. Not only the enrollment increases, so does the quality of the program. Continuous effort to recruit and retain quality 2-yr college transfer students is one of the top priorities of the department.
Funding to support research is critical to recruit, retain and graduate both undergraduate and graduate students. Chemistry department has been productive in obtaining funding to this purpose, especially the external funding. The external funding from NSF secured since summer 2008 includes:

MRI: Acquisition of a IM-Q-TOF Mass Spectrometer, $310,000, 8/15/08-7/31/11, PI: Laurence Angel, Co-PI: Frank Miskevich, Stephen Starnes, Nenad Kostic, William Whaley, Serge vonDuvillard

Scholarships and Research Experiences for Transfer Students to Excel in Science and Engineering, $593,700, 8/15/08-7/31/12, PI: Ben Jang, Co-PI: Bao-An Li, Matthew Elam, Jeffrey Kopachena

Welch Departmental Grant, $105,000, 6/1/09-5/31/12, PI: Ben Jang

Achieving Student Mastery of Chromatographic and Spectroscopic Methods in Organic Chemistry through a University/Community College Partnership, $181,192, 6/1/09-5/31/12, PI: Ben Jang, Co-PI: William Whaley, Stephen Starnes

Research Experience for 2-year College Undergraduates in Chemistry at Texas A&M University-Commerce, $219,000 (unofficial), 3/15/09-2/28/12, PI: Ben Jang, Co-PI: Stephen Starnes

The continuation of the REU program, together with the CCLI (Course Curriculum Laboratory Innovation) project (a 3-yr collaboration project among A&M-Commerce, Collin College and Northeast Texas Community College) funded by NSF, will keep the pipeline of quality 2-yr college students open to the department. The goal is to continue to recruit about 6 talented students per year in the next few years unless the number of tenured and tenure-track faculty changes. The research support is currently funded by the grants mentioned above, Provost’s office and Dr. Headley’s Welch grant. Additional support includes PTK scholarships, Nagarkatti Fellowship and other departmental scholarships. This program has already significantly impacted both the upper level undergraduate program and the graduate program.

(iii) Redesign the curriculum and the degree options of the graduate program to better recruit, retain and prepare marketable graduate students.

In Fall 08, three Professional MS degrees in chemistry were approved and implemented, including Professional MS Chemistry degree, Professional MS Chemical Business degree and Professional MS Chemical Education degree. There is one student, who started in Spring 09, in the Professional MS Chemical Education degree plan.

In addition, a new course, Chem 548 Advanced Instrument Analysis II, was offered in Fall 08 for the first time. Other analytical chemistry related courses, such as
Chem 527 Chemical and Biochemical Characterization Method I and Chem 547 Advanced Instrument Analysis I, were offered more frequently to enhance the student’s analytical and instrumentation skills to meet the market demands.

Effort in developing the relationship with companies/institutions will be pursued to provide internship opportunities for students in these degree plans. Targeted companies/institutions include Eastman Chemicals (Longview TX), Texas Instruments (Dallas TX), Alcon Laboratories (Fort Worth TX), Air Liquide (Dallas TX), various community colleges and high schools in the area, etc.

Summary:

The implementation of the action plan of the 5-yr program review is progressing well. Several courses have been cross-listed in the last three semesters. The immediate plan is to revise and develop the syllabi of cross-listed courses with two sets of approaches, two sets of expectation, and two sets of assessment. However, it is recommended to hire an additional full-time faculty to separate the cross-listed courses in the next 3-5 years to enhance student learning. The contact hour of faculty in the department could be further reduced with a more consistent adjunct supply and funding. The goal is to reduce the teaching load to 9 contact hours per full-time faculty. New hire of a stockroom manager, if available, should have additional teaching responsibilities while additional GAs are needed to support the stockroom operation.

Both the 3-yr MS program and the three Professional MS degrees in chemistry have taken off smoothly. Transfer REU students have made a big impact on the atmosphere of the department. Effort in developing the relationship with companies/institutions will be pursued to provide internship opportunities for graduate students in the final year of their degree plans.

Funding support on research is very critical to recruit, retain and graduate quality students in Chemistry. The department, with the administration support, has been successful in capturing funding to provide such support. Continuous effort, collaborating with the administration, in pursuing funding is necessary to sustain the growth and to further improve quality education of the department.