Division of Chemistry
2002-2003

Expanded Statement of Institutional Purpose

Mission Statement

Chemistry, the central science, is an active discipline vital to human existence and essential to the understanding of industrial, economic, and environmental issues. The mission of the Division of Chemistry is to instill an understanding of chemistry and its relevance through quality teaching, scholarly and professional activities, and service. In a world that is becoming increasingly more technical and complex, providing chemical instruction with the depth, breadth, and rigor for students to meet this need is critical.

Program Intended Educational Outcomes – 2002 - 2003

Outcomes/Objectives

1a. Courses will be taught by faculty with appropriate expertise and excellence in their fields of teaching.
1b. Students will learn and demonstrate an understanding of theoretical chemical principles.
2a. Qualified faculty mentors with appropriate expertise in their fields will offer chemistry laboratories, scholarship, employment, and other hands-on experiences for students.
2b. Students will practice and demonstrate chemistry principles via laboratory experiments, undergraduate research / employment, discussions out of class, etc.
3a. Students will learn and demonstrate the ability to critically think about chemistry principles, and to communicate such items via oral and written means.
3b. Class size will be limited to what is pedagogically most appropriate and / or meets ACS criteria.
4a. Students desiring graduate degrees will have the opportunity to develop and demonstrate their abilities to meet entrance requirements: tests, scholarship, etc.

Means of Program Assessment and Criteria for Success

Assessment Criteria and Activities

1a./2a. Only doctoral qualified faculty with demonstrated expertise and above-average performance in appropriate chemistry sub-fields will be hired, promoted, and retained in tenured positions. Faculty will annually attend faculty development activities to enhance subject knowledge and presentation methods.
1b./2b. Chemistry students will pass their major courses with a minimum grade of "C" or better. The average score on the ACS final exam by students in each chemistry course will exceed the 50th percentile. The average score on each section of the ETS field exams by graduating seniors will exceed the 50th percentile. Graduating seniors will also have had undergraduate research or employment experiences.
3a. A capstone course will assess each student's ability to communicate via a written and oral report, which will also evaluate prior "course embedded activities" requiring critical, logical, and analytical thinking.

Summary of Data Collected

1a/2a All six full-time faculty are doctorally qualified, and have specializations covering analytical, biochemistry, inorganic, organic, and physical chemistry. All faculty are attending development activities for teaching
1b/2b. Chemistry students have passed their major courses with a minimum grade of "C" or better. In 2002-2003 the average scores on all ACS final exams in each chemistry course have exceeded the 50th percentile (see appendix A). Moreover, average scores on ETS field exams by graduating seniors have also exceeded the 50th percentile (See Appendix A). All graduating seniors have had undergraduate research and/or employment experiences.

3a. CHEM 4990 has been established as the capstone course for all chemistry majors. Students prepare a review article and present it verbally in class on research topics (requiring critical, and analytical thinking).

Use of Results

1a/2a. At this time, no added action is required for the six full-time faculty. We will be required to justify the adjunct part-time faculty member who has a master's degree in biology.

1b/2b No action is necessary at this time to match the minimum level of 50th percentile in ACS and ETS exams. We will continue to increase the percentile scores as high as possible.

3a. No action in currently necessary.

Expanded Statement of Institutional Purpose (Cont'd)

Goal Statement

The Division of Chemistry will:
1. Provide expert instruction in all classroom settings: lectures, labs, recitations, etc.
2. Provide students competitive opportunities for scholarship, employment, and other / hands-on experiences with qualified faculty mentors.
3. In a personalized environment, educate students to think critically and independently, and to improve communicative, creative, analytic and information gathering skills.
4. Prepare students who choose to pursue graduate degrees upon graduation either in chemistry or the health sciences.
5. Prepare students who choose to pursue employment upon graduation in a science related field in business/ industry / education.
6. Provide service courses for other academic and professional programs, and for the general education experience
7. Meet or exceed standards of an accredited chemistry program as established by the American Chemical Society (ACS).

Program Intended Educational Outcomes – 2002 – 2003 (Cont'd)

Outcomes/Objectives

4b. Appropriate tracks of study will be provided for professional chemistry and allied health majors.
5a. Students desiring employment upon graduation will be prepared for business, industry, or education.
5b. Appropriate tracks of study will be provided for professional chemistry and education majors.
6. In addition to offering courses for the campus general education program, the division will provide chemistry courses that can meet the needs of both chemistry majors as well as other academic majors.
7a. The chemistry program will be accredited by the American Chemical Society (ACS), assuming that adequate resources are available to meet ACS criteria.
7b. The Division will continue to align the chemistry curricula at SUU with the nationalized ACS curricula.

Means of Program Assessment and Criteria for Success (Cont'd)

Assessment Criteria and Activities

3b. Sizes of classes will be monitored relative to scores on ACS final exams and ETS field exams.
4. Scores of students or entrance success relative to admittance standards in graduate chemistry programs will be tracked. In addition, Dental Admission Test (DAT), Medical College Admission Test (MCAT), and other relevant scores will be monitored for determining subject matter mastery. (Also, see 1b/2b above).
5. Placement of graduates will be monitored annually. Surveys of students and employers will assess chemistry graduates preparedness.
6. Surveys of general education students will be implemented to assess success of courses. Surveys of general chemistry will assess value of the Peer Led Team Learning project for this service class.
7a. The chemistry program will be submitted for accreditation by ACS during the 2002-2003 year.
7b. For best practice and economy, only ACS approved courses will be included in the major curricula.
7c. The Division will continue to utilize the nationalized ACS exams as final exams for each course in the SUU chemistry curricula.
7d. The Division will continue to require all graduating seniors to take the Educational Testing Service (ETS) field exams.

Summary of Data Collected (Cont'd)

3b. Class sizes did not exceed 50 enrollees per section. Perhaps, this accounts for all scores exceeding the 50th percentile on all classes.
4. Scores from students who shared their test results for entrance to graduate school and health fields demonstrate that they had mastered chemistry subject materials. None appeared lower than 70th percentile.
5. All graduating seniors were either placed in employment or went on to graduate education.
6. Surveys of the Peer-Led Team Learning Project demonstrates that this was highly popular among general chemistry students.
7a. The chemistry program was submitted to the ACS for accreditation during Spring semester 2003
7b. Only ACS approved courses are included in the present curriculum.
7c. See item 1b/2b for results on ACS/ETS tests.

Use of Results (Cont'd)

3b. To maintain the maximum class size allowed at 50 enrollees or less, the Division of Chemistry will be offering selected upper division classes on an every-other-year basis. In this fashion, the average class size in chemistry will be kept at an optimal level for efficiency.
4. The Division must be more aggressive in obtaining entrance exam scores from all students entering graduate programs in chemistry or medical fields.
5. No action is necessary at this time.
6. For 2003-2004, Peer-Led Team Learning will hopefully be adopted in a larger number of sections for general chemistry (CHEM 1210-1220 series).

7a. As soon as the initial results of an accreditation visit are known, the Division of Chemistry will initiate necessary changes to achieve ACS accreditation.
7b. No action is necessary at this time.
7c. No action is necessary at this time.

Appendix A

ACS Final Exam Average Percentiles – All Students

Course	Course Topic	Average percentile Student Ranking
CHEM 1110-1130	General-Organic-Biochemistry	57th
CHEM1210-1230	General Chemistry	53rd
CHEM 2310-2320	Organic Chemistry	70th
CHEM 4160	Inorganic Chemistry	62nd
CHEM 4230	Instrumental Analysis	63rd
CHEM 3610-3630	Physical Chemistry	58th
CHEM 4120	Biochemistry	94th

Graduating Chemistry Seniors
ETS Field Test Average Percentiles (2001 and 2002)

Course Topic	Average Percentile Student Ranking	
	2001	2002
Analytical Chemistry	79th	83rd
Inorganic Chemistry	76th	86th
Organic Chemistry	96th	99th
Physical Chemistry	63rd	81st
Overall	89th	92nd