

**Chemistry Degree Program
Assessment of Student Learning Plan
Kansas State University**

- Check the box if your program's student learning outcomes have been modified since November 2003. If so, please email (apr@ksu.edu) or attach a hard copy to this document.

A. College, Department, and Date

College: Arts and Sciences
Department: Chemistry
Date: February 14, 2004

B. Contact Person(s) for the Assessment Plan

Yasmin Patell, Assistant Professor

C. Degree Program

B.S./B.A. in Chemistry

D. Assessment of Student Learning Three-Year Plan

1. Student Learning Outcome(s)

The Chemistry Department will focus on the following three learning outcomes in our three-year assessment plan.

Graduates from the Chemistry degree program will have demonstrated:

- an understanding of major concepts, theoretical principles and experimental findings in chemistry.
- a working knowledge of basic research methodologies, data analysis and interpretation.
- effective written and oral communication skills, especially the ability to transmit complex technical information in a clear and concise manner.

Relationship to K-State Student Learning Outcomes

Program SLOs	University-wide SLOs (Undergraduate Programs)				
	Knowledge	Critical Thinking	Communication	Diversity	Academic/ Professional Integrity
1. an understanding of concepts, theoretical principles and experimental findings in chemistry.	X	X			
2. a working knowledge of basic research methodologies, data analysis and interpretation.	X	X	X		X
3. effective written and oral communication skills, especially the ability to transmit complex technical information in a clear and concise manner.	X	X	X		X

2. How will the learning outcomes be assessed? What groups will be included in the assessment?

- An understanding of major concepts, theoretical principles and experimental findings in chemistry.
 - This learning outcome will be assessed by all chemistry majors enrolled in the two introductory courses CHM 220 and CHM 250.
 - CHM 220 and CHM 250 are introductory courses which introduce and describe the foundation of theoretical and experimental chemistry. This learning outcome will be assessed extensively throughout both courses with a minimum of eight locally developed multiple-choice and short-answer exams. [direct measure]
- a working knowledge of basic research methodologies, data analysis and interpretation.
- effective written and oral communication skills, especially the ability to transmit complex technical information in a clear and concise manner.
 - These learning outcomes will be assessed by all chemistry majors enrolled in the Senior Thesis Research course, CHM 599.
 - All chemistry majors will carry out a research project during their last semester, the Senior Thesis Research (CHM 599), which requires each student to utilize many of the practical and theoretical skills that they have accumulated during the preceding terms. The project is carried out under the supervision of a faculty member, but each student is given considerable responsibility for acquiring the necessary specialist knowledge, devising research methodologies, and for acquiring and interpreting new scientific data. These learning outcomes will be assessed by virtue of having each student write a comprehensive report detailing scientific hypotheses, research methodologies, pertinent experimental and theoretical data, and conclusions. A scoring rubric will be used in this assessment. [direct measure]
 - As part of the Senior Thesis Research, CHM 599, each student will also give several oral research presentations to their respective research groups. A scoring rubric will be used in this assessment. [direct measure].

3. When will these outcomes be assessed? When and in what format will the results of the assessment be discussed?

Learning Outcomes	2005	2006	2007	
1. an understanding of concepts, theoretical principles and experimental findings in chemistry.	S05 (CHM 250) F05 (CHM 220)	S06 (CHM 250) F06 (CHM 220)	S06 (CHM 250) F06 (CHM 220)	Chemistry faculty will meet annually to discuss the data collected. Each set of data will be presented to the faculty by the person responsible for teaching the relevant course.
2. a working knowledge of basic research methodologies, data analysis and interpretation. 3. effective written and oral communication skills, especially the ability to transmit complex technical information in a clear and concise manner.	S05 (CHM 599) F05 (CHM 599)	S06 (CHM 599) F06 (CHM 599)	S07 (CHM 599) F07 (CHM 599)	Chemistry faculty will meet annually to discuss the data collected. Each set of data will be presented to the faculty by the person responsible for teaching the relevant course.

4. What is the unit's process for using assessment results to improve student learning?

We are unable to be specific on an improvement plan until the faculty have all the data which will be collected over the next three years.

STUDENT LEARNING OUTCOMES

B.S./B.A. Chemistry Degree (ACS certified)

CIP Code: 400501

Graduates from the Chemistry degree program will have demonstrated:

1. an understanding of major concepts, theoretical principles and experimental findings in chemistry.
2. an ability to solve problems in an efficient and accurate manner.
3. an ability to employ critical thinking and hypothesis-driven methods of scientific inquiry.
4. a working knowledge of basic research methodologies, data analysis and interpretation.
5. effective written and oral communication skills, especially the ability to transmit complex technical information in a clear and concise manner.
6. the ability to use computers for chemical simulation and computation, data acquisition, and database usage.
7. the ability to use instrumentation for chemical analysis and separation.
8. a familiarity with, and application of local, state and federal safety and chemical hygiene regulations and practices.
9. an appreciation of the importance and practice of good ethics.
10. an ability to work effectively in teams in both classroom and laboratory.