

Academic Program Plan for Assessment of Student Learning Outcomes  
The University of New Mexico

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**A. College, Department and Date**

1. College: *Arts and Sciences*
2. Department: *Chemistry and Chemical Biology (CCB)*
3. Date: *October 26, 2014*

**B. Academic Program of Study\***

*Ph.D. Chemistry*

**C. Contact Person(s) for the Assessment Plan**

*Karen McElveny, Advising Coordinator, kamc@unm.edu*

**D. Broad Program Goals & Measurable Student Learning Outcomes**

**1. Broad Program Learning Goals for this Degree/Certificate Program**

Successful students will have

- A. In-depth knowledge of chosen area of Chemistry or Chemical Biology
- B. Ability to critically evaluate the chemical literature and new results
- C. Ability to conceive, plan and execute a chemical research project
- D. Ability to present and defend persuasively research conclusions

**2. List of Student Learning Outcomes (SLOs) for this Degree/Certificate Program**

- A. Student can demonstrate in-depth knowledge of their chosen area of Chemistry or Chemical Biology in writing.
- B. Student can analyze and critique the existing literature related to their dissertation research.
- C. Student will propose an original research project in their field, defend its originality and significance, and carry out the needed experiments and computation.
- D. Student will present the project results orally and in writing and defend its conclusions.

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\* Academic Program of Study is defined as an approved course of study leading to a certificate or degree reflected on a UNM transcript. A graduate-level program of study typically includes a capstone experience (e.g. thesis, dissertation, professional paper or project, comprehensive exam, etc.).

*Adapted from Kansas State University Office of Assessment*

**E. Assessment of Student Learning Three-Year Plan**

All programs are expected to measure some outcomes annually and to measure all priority program outcomes at least once over two consecutive three-year review cycles. Describe below the plan for the next three years of assessment of program-level student learning outcomes.

**1. Student Learning Outcomes**

Relationship to UNM Student Learning Goals (insert the program SLOs and check all that apply):

<b>University of New Mexico Student Learning Goals</b>				
<b>Program SLOs</b>	<b>Knowledge</b>	<b>Skills</b>	<b>Responsibility</b>	<b>Program SLO is conceptually different from university goals.</b>
A. Student can demonstrate in-depth knowledge of their chosen area of Chemistry or Chemical Biology in writing.	X	X		
B. Student can analyze and critique the existing literature related to their dissertation research.	X	X	X	
C. Student will propose an original research project in their field and defend its originality and significance	X	X	X	
D. Student will present the project results orally and in writing and defend its conclusions.	X	X	X	

## 2. How will learning outcomes be assessed?

All Ph.D recipients will be assessed on all SLOs.

- A. The student will demonstrate in-depth knowledge of their chosen area of Chemistry or Chemical Biology by passing a sequence of written exams (cumulative exams) with a score of  $\geq 70\%$  on four exams given by faculty. Direct measure.
- B. The student will provide a written analysis and critique of existing literature related to his/her dissertation research, first in the dissertation research proposal and later in the dissertation itself. The student will summarize and defend this critique before a faculty committee, which will provide a written evaluation of the student's performance. Direct measure.
- C. The student will write an original research proposal based on the literature critique and will present and defend the planned project in their field before a faculty committee, which will provide a written evaluation of the student's performance. Direct measure.
- D. Student will present the project results orally and in writing as a dissertation and defend its conclusions before a faculty committee, which will provide a written evaluation of the student's performance.

Assessment instruments will include the cumulative exams (for SLO A), reports of the dissertation proposal exam (B and C), copies of selected dissertation proposals (B and C), reports of the dissertation defense exam (B, C and D), and copies of selected dissertations (B, C and D).

## 3. When will learning outcomes be assessed? When and in what forum will the results of the assessment be discussed?

Assessments will be conducted by the departmental Graduate Studies Committee (GSC) on a 3-year cycle. In the first year, (AY 15-16, AY 18-19, etc.) the GSC will evaluate SLO A by examining the results of the cumulative exams from the previous three years, including overall scores, pass rates, and examination of sample exam papers. In the second year (AY 16-17, 19-20, etc.), the GSC will evaluate SLO's B and C through examination of the dissertation proposal and oral exam results, including overall pass rates, faculty evaluations of student performance and copies of example proposals. In the third year (AY 17-18, AY 20-21, etc.), the GSC will evaluate SLO's B, C and D through examination of the dissertation and defense, including pass rates, time to degree, faculty evaluations of student performance and copies of selected dissertations.

In each case, the GSC will conduct its evaluation in the Fall semester and present results in a faculty meeting the following Spring along with recommendations for changes, if any. Significant changes will also be discussed with the graduate students and the external advisory board.

**4. What is the unit's process to analyze/interpret assessment data and use results to improve student learning?**

Required assessment data will be generated by graduate faculty via written and oral graduate examinations. For this purpose, the department will provide standard assessment instruments which specifically refer to elements of the SLOs for use in graduate student exams. The data will be collected and maintained by the graduate advising coordinator, and evaluated by the Graduate Studies Committee. The GSC will advise the department chair and faculty of their evaluation and recommend changes in the graduate program and assessment procedures as necessary to improve student learning and to make the assessment process more responsive and reliable.