

**PhD Biomedical Sciences  
Assessment of Student Learning Plan  
University of New Mexico**

**A. College, Department and Date**

1. College: UNM School of Medicine
2. Department: *Biomedical Sciences*
3. Date: *5/7/08*

**B. Academic Program of Study**

*PhD Biomedical Sciences*

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

*Angela Wandinger-Ness, PhD*

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

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

<b>1</b>	<b>Competent, skilled experimentalists</b>
<b>2</b>	<b>Problem solvers</b>
<b>3</b>	<b>Critical and independent thinkers</b>
<b>4</b>	<b>Expert in the field with both depth and breadth of knowledge</b>
<b>5</b>	<b>Excellent communicators</b>
<b>6</b>	<b>Exemplars of high ethical standards</b>
<b>7</b>	<b>Collaborators and team players</b>

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

<b>1</b>	<b>Set up and conduct experiments that produce tangible results. Operate equipment and execute methods required for project completion.</b>
<b>2</b>	<b>Diagnose, evaluate, test and determine how to overcome technical and practical problems.</b>
<b>3</b>	<b>Analyze, critique and dissect biological problems. Formulate new hypotheses based on available data, devise strategies for hypothesis testing, and organize and analyze data for publication.</b>
<b>4</b>	<b>Explain and illustrate discipline-specific subject matter. Interpret and evaluate primary literature.</b>
<b>5</b>	<b>Succinctly explain and summarize state of knowledge in field, interpretation of results and conclusions in oral and written form.</b>
<b>6</b>	<b>Demonstrate working knowledge of responsible conduct in research. Critically reflect on ethical problems.</b>
<b>7</b>	<b>Demonstrate 'people' skills. Work cooperatively as part of interdisciplinary teams.</b>

## 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

University of New Mexico Student Learning Goals			
Program SLOs	Knowledge	Skills	Responsibility
1. Set up and conduct experiments that produce tangible results. Operate equipment and execute methods required for project completion.	√	√	√
2. Diagnose, evaluate, test and determine how to overcome technical and practical problems.	√	√	√
3. Analyze, critique and dissect biological problems. Formulate new hypotheses based on available data, devise strategies for hypothesis testing, and organize and analyze data for publication.	√	√	√
4. Explain and illustrate discipline-specific subject matter. Interpret and evaluate primary literature.	√	√	√
5. Succinctly explain and summarize state of knowledge in field, interpretation of results and conclusions in oral and written form.	√	√	√
6. Demonstrate working knowledge of responsible conduct in research. Critically reflect on ethical problems.	√	√	√
7. Demonstrate 'people' skills. Work cooperatively as part of interdisciplinary teams.	√	√	√

### 2. How will learning outcomes be assessed?

#### A. What:

- i. *For each SLO, briefly describe the means of assessment, i.e., what samples of evidence of learning will be gathered or measures used to assess students' accomplishment of the learning outcomes in the three- year plan?*
- ii. *Indicate whether each measure is **direct** or **indirect**. If you are unsure, then write "Unsure of measurement type." There is an expectation that at least **half of the assessment methods/measures will be direct** measures of student learning. [See attached examples of direct and indirect measures.]*
- iii. *Briefly describe the **criteria for success** related to each direct or indirect means of assessment. What is the program's performance target (e.g., is an "acceptable or better" performance by 60% of students on a given measure acceptable to the*

program faculty)? If scoring rubrics are used to define qualitative criteria and measure performance, attach them to the plan as they are available.

<b>i. SLO Assessment</b>		<b>ii. Direct/Indirect</b>	<b>iii. Criteria for Success</b>
<b>Assessment Type</b>	<b>Description</b>		
<b>Capstone Experiences</b> (e.g., projects, papers, theses, dissertations, presentations, research)	Written PhD Dissertation required. Measures SLO # 1-5 and 7.	<b>Direct</b>	To earn a PhD, must complete a written dissertation that is approved by a dissertation committee, consisting of faculty approved for graduate study, program director and Office of Graduate Studies. In the event that work has not been submitted for publication or externally reviewed, an out of state examiner must approve the dissertation.
<b>Exams</b> (e.g., qualifying exams, comprehensive exams, national standardized exams, certification or licensure exams)	<ul style="list-style-type: none"> <li>• Oral Qualifying Exam at the end of Year 1. Measures SLO # 2-5.</li> <li>• Oral and Written Comprehensive Exam during years 3-4. Measures SLO # 1-5.</li> <li>• Oral Dissertation Defense. Measures SLO # 1-5 and 7.</li> </ul>	<b>Direct</b>	<ul style="list-style-type: none"> <li>• Must pass qualifying exam after 2 attempts. Exam Chair and BSGP steering committee oversight.</li> <li>• Must pass or conditionally pass comprehensive exam on first attempt. BSGP steering committee, program director and OGS oversight.</li> <li>• Must pass or conditionally pass dissertation exam on first attempt. BSGP steering committee, program director and OGS oversight.</li> </ul>
<b>Internship or Practicum</b> Evaluations of student-specific knowledge or skills from internship supervisors or faculty overseers based on stated program objectives and structured observation of student performance	<ul style="list-style-type: none"> <li>• During first-year curriculum, students are required to complete a series of ethics, safety, human subjects and animal use trainings. Measures SLO 1 and 6.</li> <li>• Lab research with designated Research Mentor. Measures SLO 1-7.</li> <li>• Committee on Studies (COS) meetings (3-6 Faculty; minimum 1 external department member) to review student research progress. COS meetings held every 6-12 months with written report signed by committee members and student. Report also indicates expected progress for next meeting. COS acts as Comprehensive Exam and Final Defense Exam Committees and faculty are approved for committee service by Office of Graduate Studies. Measures SLO 1-7.</li> </ul>	<b>Direct</b>	<ul style="list-style-type: none"> <li>• Documentation of completed training. Participation in oral and written discussion of all ethics cases as part of BIOM 501. 100% compliance.</li> <li>• Annual activities report submitted by student. Req. for travel awards.</li> <li>• Demonstrated progress toward program milestones that is positively evaluated by COS reports. Deficiencies are expected to be addressed by next meeting. Reports are evaluated by program director and retained in student files. Any significant issues are evaluated by BSGP steering committee.</li> </ul>
<b>Portfolios</b> Reviewed by program faculty, outside faculty, professionals, visiting scholars or	Annual review of student file/progress, which includes Annual Activities and Accomplishments Report, by BSGP Faculty Student Progress Sub-	<b>Direct</b>	Student files are evaluated annually by BSGP steering subcommittee for expected progress toward milestones. Formal progress reports are sent to

industry boards	Committee. Measures SLO 1-5.		students and mentors noting any deficiencies and expectations for resolution.
<b>Reviews by Professional Jurors of Evaluators</b> Assessment of student projects, papers, posters, etc.	Professional meeting attendance with poster or oral presentations. Measures SLO 1, 3-5.	<b>Direct</b>	Students are expected to attend and present at an average of two professional meetings during their degree program allowing their work to be evaluated by professionals in the field.
<b>Student publications</b> (in campus, local, regional, national, or international venues)	Publication in peer reviewed journals as first or co-author. Measures SLO 1-7.	<b>Direct</b>	Academic Program Review completed in 2007 for past ten years found that between 2000 and 2005 there were 1.5 peer reviewed publications per student. We expect to maintain or exceed this average.
<b>Successful research applications</b> (funded or unfunded)	Receipt of NRSA, private foundation fellowships or appointment to training grants. Measures SLO 1-7.	<b>Direct</b>	For the period of 2006-2007, 9.5 students had graduate fellowships, 15.5 had training grant awards of 124 total trainees. This data includes PhD and MD/PhD recipients. Unfunded applications are not tracked. We expect to maintain or exceed this average.
<b>Student academic awards</b>	Research, Project Travel Awards granted by Office of Graduate Studies, BSGP Travel Awards, Travel Awards from Professional Societies, Regents Scholars Awards. Measures SLO 3-5.	<b>Direct</b>	Approximately 10% of our students receive academic awards annually. We expect to maintain or exceed this average.
<b>Exit interviews or focus groups with graduates</b>	Written exit survey is collected upon graduation for tracking career path. Overall program satisfaction is not assessed.	<b>Indirect</b>	Not established.
<b>Interviews with instructors, program coordinators or others who have direct contact with students</b>	BSGP Steering Committee solicits annual to biannual feedback from course instructors through oral report to committee.	<b>Indirect</b>	Student performance in courses and on qualifying exam provide measure of how well first year curriculum prepares students for graduate study.
<b>Retention and transfer studies</b>	This data is collated from departmental records and Office of Educational Research.	<b>Indirect</b>	Between 1996 and 2006, the PhD drop-out rate was 8.6%. PhD students terminating with a MS degree was 0.4%. We expect to maintain or improve on these statistics.
<b>Length of time to degree</b>	5.4 years for PhD	<b>Indirect</b>	We expect to maintain or improve on this average.
<b>GRE scores</b>	V/Q Average GRE Scores for incoming PhD students is 1210 for 2003-2008	<b>Indirect</b>	We have improved on the average GRE scores by 61 points relative to the previous 6 years. We expect to maintain or improve on this average.
<b>Job placement rates of graduates (including post doc fellowships)</b>	Students go on to post-doctoral fellowships, medical school, other professional schools, teaching positions, national laboratories and industry positions.	<b>Indirect</b>	Rates are not consistently tracked at program level, therefore, criteria for success are not established.

<b>Analysis of grade distributions</b>	Overall GPA of 3.0 or higher. Students are required to earn at least a B- for all first-year core courses. Students who earn less than a B- are required to re-take the course in a future semester.	<b>Indirect</b>	100% compliance is expected for continuation in the program.
<b>Observing and recording students' behaviors</b>	Primary responsibility falls on the research mentor, with support from the Committee on Studies, Steering Committee and Program Director to provide guidance and consultation for issues related to student progress, professionalism and skill development; especially issues related to research ethics. Measures SLO 1-7.	<b>Indirect</b>	Not established.

B. Who: State explicitly whether the program's assessment will include evidence from all students in the program or a sample. Address the validity of any proposed sample of students.

Program assessment will include evidence from all students in the program.

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

<b>Time line</b>	<b>Assessment Type</b>	<b>ii. Direct/Indirect</b>	<b>Report/Measures</b>
<b>Annually</b>	<b>Capstone Experiences</b>	<b>Direct</b>	# of successful PhD graduates with fraction of Honors Recipients.
<b>Annually</b>	<b>Exams</b>	<b>Direct</b>	Comprehensive Exams – Pass/Fail rate, # of Honors Recipients, Time to Advancement to Candidacy
<b>Annually</b>	<b>Student publications</b>	<b>Direct</b>	# of primary or co-authored publications in peer reviewed journals per student
<b>Every 3 Years</b>	<b>Length of time to degree</b>	<b>Indirect</b>	Average time to degree over a 3 year period.
<b>Annually</b>	<b>GRE scores</b>	<b>Indirect</b>	Average V/Q scores for matriculated students; indicator of potential for graduate study.

2010-2011: Progress toward plan to address weaknesses noted in Academic Program Review to be discussed with all stakeholders and reviewed by UNM Provost (see attached).

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

*Briefly describe:*

- 1. who will participate in the assessment process (the gathering of evidence, the analysis/interpretation, recommendations).*

Student files are maintained by the Biomedical Research Education Program office that includes a team of administrative staff, faculty academic program directors and an Assistant Dean for Research Education. Data gathering for student assessment is the responsibility of the graduate course directors, faculty research mentors, individual committee on studies, a programmatic faculty steering committee and an institutional education research office. Interpretation and recommendations are the responsibility of committee on studies, programmatic faculty steering committee and the program director. The program is expected to undergo a self-study (includes University Provost, Office of Graduate Studies, among others) and external review on a seven year cycle. Recommendations made by external review committee provide impetus for formulation of new 3-year plan.

2. *the process for consideration of the implications of assessment for change:*
  - a. *to assessment mechanisms themselves,*
  - b. *to curriculum design,*
  - c. *to pedagogy**...in the interest of improving student learning.*

A fourteen member interdepartmental steering committee with rotating faculty and student membership and chaired by the program director is charged with admissions, student progress and program oversight. Course directors interface with the committee and the program director. Curriculum design is overseen by the steering committee in conjunction with program faculty.

3. *How, when, and to whom will recommendations be communicated?*

Annually communicated to program faculty by program director and Assistant Dean for Research Education.