

2016

Department of Chemistry and Biochemistry M.S. Assessment Plan



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Graduate Studies and Assessment Committee
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College of Liberal Arts and Sciences
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A. The M.S. Candidate in Chemistry will:

1. Demonstrate proficiency in chemical sciences and conduct research that culminates in a thesis. In particular:

- a. All students will demonstrate knowledge proficiency at the 50th percentile composite norm level in general chemistry and two undergraduate chemical subject areas, with at least one subject area in the field of study.
- b. All students will clearly articulate and assemble evidence pertaining to questions or challenges in their primary field of study using appropriate inquiry-based methodologies and practices.
- c. All students will demonstrate an accurate understanding of their research, have a broad understanding of their primary field of study, and will evaluate or synthesize information related to questions or challenges.

2. Effectively engage undergraduate students as Teaching Assistants and consistently practice laboratory safety. In particular:

- a. All students will demonstrate comprehensive knowledge of the NIU Chemical Hygiene Plan, participate in lab safety training, and consistently practice and promote all safety policies in their assigned teaching and research laboratories.
- b. 90% of students will apply sound pedagogical practices as laboratory or recitation instructors and will be considered effective instructors by at least 70% of their assigned undergraduate students.

3. Communicate published research using clear and effective language. In particular:

- a. All students will be able to give a seminar in the primary field of study that organizes, accurately presents, and explains the significance of the published works of others.

4. Demonstrate professional conduct and ethics:

- a. All students will know and apply the principles of ethical and professional conduct.

Indirect Measures:

5. OAS Supplemental Survey.

- a. 90% of M.S. graduates will report that the M.S. Chemistry program met or exceeded expectations in providing feedback, support, and training to develop skills in content proficiency, teaching and safety effectiveness, technical writing and speaking.
- b. All M.S. Chemistry graduates will obtain full-time employment within six months of graduation.

B. Explanation of Methods.

The following table summarizes methods used in the M.S. Assessment Plan to gather quantitative data on the Student Learning Outcomes (SLOs) listed in section A. The timeline for the M.S. Assessment Plan spans five semesters and begins with "Semester 1" to accommodate the program's practice of admitting students in both fall and spring semesters. Students are responsible for regularly entering their SLO data into Individual Development Plans (IDPs) and for scheduling meetings with faculty advisory committees, beginning semester 2. An important role of the advisory committees is use the SLO data to improve student performance. The advisory committees later become the student's thesis or project defense committees. SLOs are referenced in the following Summary table using the coding format in section A (SLO 1a, 1b, etc.).

Summary of Assessments.

Method and Type	Description	Target	Timeline	Person(s) Responsible
Standardized ACS (American Chemical Society) Exams Direct, Summative	SLO 1a: Measures content proficiency at the undergraduate level in chemistry.	All M.S. students will achieve a minimum 50 th percentile composite norm score in general chemistry and two subject areas of chemistry.	Administered to all entering M.S. students during orientation week. Re-taken, if < 50 th percentile, during orientation week in the next semester.	Divisional Faculty and the Director of Graduate Studies
Written thesis or project (project applies to M.S. Teacher Licensure candidates). Direct, Summative	SLO 1b: Measures quality of argument, novelty, and connection to other's published scholarship in the primary research area. Emphasis on first draft of thesis or project before substantial revision by research advisor.	All M.S. students will meet or exceed expectation on a written thesis/project scoring rubric.	Defending semester, typically semester 5 for thesis candidate or semester 4 for Teacher Licensure candidate.	Research Advisor / Defense Committee
Oral comprehensive exam; oral defense of thesis or project research. Direct, Summative	SLO 1c: Uses a formal presentation and question/answer setting to measure content knowledge across chemical disciplines and in the primary field of study.	All M.S. students will meet or exceed expectation on oral comprehensive exam and oral defense of thesis/project research scoring rubrics.	Defending semester, typically semester 5 for thesis candidate or semester 4 for Teacher Licensure candidate.	Defense Committee

Undergraduate laboratory teaching (TA); graduate lab safety course activities. Direct, Summative	SLO 2a: Measures if TA provides sufficient lab safety training to assigned undergraduates and follows all safety practices and procedures; also successfully completes a graduate lab safety course (currently a special section of CHEM 690).	All M.S. students will meet or exceed expectation on a TA Lab Safety scoring rubric.	Each semester in which the M.S. student is a TA. The lab safety course, which is offered during the spring semester, is taken once and the outcomes factored into the scoring rubric.	Safety personnel in the NIU Office of Research Compliance, Integrity, and Safety.
Undergraduate laboratory teaching (TA) Direct, Summative	SLO 2b: Measures teaching effectiveness of TA using both content and pedagogy indicators.	90% of M.S. students assigned as TAs will meet or exceed expectation by at least 70% of their undergraduates on a Teaching Effectiveness scoring rubric completed by the assigned undergraduates. Response rate must also be at least 70%.	Each semester in which the M.S. student is a TA.	Chemistry Office Assistant Specialist.
Seminar presentation, CHEM 615. Direct, Summative	SLO 3a: Measures ability to report on the published scholarship of others.	All M.S. students will meet or exceed expectation on a seminar presentation scoring rubric.	Each semester, beginning semester 2.	Seminar Coordinator and graduate students attending.
Professional development course, CHEM 690. Direct, Summative	SLO 4a: Measures understanding of responsible conduct of research.	All M.S. students will meet all CHEM 690 requirements.	Semester 1, 2, 3, and 4.	Director of Graduate Studies.
Supplemental alumni survey and data approved for use in lieu of Employer feedback Indirect, Formative and Summative	<u>OAS</u> : Alumni will be surveyed for satisfaction levels in various skill areas. <u>Department</u> : M.S. candidates will receive an exit interview to assess satisfaction levels in various skills. Peer-reviewed publications, juried presentations or, in the case of M.S. Teacher candidates, supervising teacher evaluations will also be collated.	90% of alumni will declare that the program met expectation in areas of: Content Safety Teaching Technical writing Oral presentation Research 80% of graduates will be professionally employed within 6 months.	Defending semester, typically semester 5. OAS survey will occur later.	Office of Assessment Services, Director of Graduate Studies, Research Advisor, or other appropriate evaluator,

