Program: MS Chemistry

Assessment Coordinator: John Antos

Program Mission: The mission of the Chemistry MS program is to provide a high quality postgraduate education, including rigorous and engaging coursework, valuable teaching opportunities, and cutting edge research to prepare students for professional careers as scientists, educators, and health professionals.

Program Student Learning Goals:

1. provide training in the skills and practice of modern chemical/biochemical research
2. prepare students for a range of careers in the chemical/biochemical sciences
3. facilitate in depth learning within select areas of chemistry and biochemistry through both upper level coursework and project focused inquiry
4. provide training in student-centered pedagogy and meaningful teaching opportunities

Program Student Learning Objectives:

Graduates of the WWU Chemistry MS program will be able to:

a. critically evaluate the primary literature (Goals 1, 2, 3)
b. independently design, execute, and interpret the results of scientific experiments (Goals 1, 2, 3)
c. implement best safety practices in both teaching and research (Goals 1, 2, 4)
d. effectively communicate scientific concepts and results in both oral and written form to a discipline specific audience (Goals 1, 2)
e. understand and explain the societal impacts/benefits of their particular research area (Goals 1, 2, 3)
f. successfully engage in networking with peers in the field through interaction with seminar speakers and as attendees of professional meetings (Goal 1, 2, 3)
g. instruct undergraduate students using modern pedagogical approaches (Goal 4)
h. demonstrate a sophisticated understanding of their specific research area (Goal 1, 2, 3)
Please respond to the following:

1. Describe the level of faculty participation on this assessment.

   During the 2015-2016 academic year, the specific assessment activity conducted (see table below) involved participation by all department faculty and some instructional staff. Specifically, this involved attending and evaluating graduate student seminars.

2. Describe the frequency of evaluating the program SLOs.

   The SLO’s drafted in fall 2015 represented the first formal assessment plan for the MS in chemistry program. These SLO’s will be re-evaluated in fall 2016.

3. How are the assessments meaningfully connected to improvement efforts?

   The assessment activity for 2015-2016 involved evaluation of student oral presentations by faculty and instructional staff. The results of these evaluations were returned to student presenters and their advisors. The specific feedback will not only help current graduate students prepare for subsequent presentations, but will also guide faculty as they mentor future students preparing to give oral presentations. In addition, the 2015-2016 assessment activities have indicated a need to revise the scoring rubric used for evaluating student seminars (the rubric used during the 2015-2016 academic year is attached to this report). A revised rubric will be designed and implemented in 2016-2017.
**Student Learning Objectives Assessed This Year:**

<table>
<thead>
<tr>
<th>Assessment Measures</th>
<th>SLOs Assessed</th>
<th>Results and Improvements</th>
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</thead>
<tbody>
<tr>
<td>Chemistry MS students gave oral proposal presentations in their 3rd or 4th quarter of enrollment focused on providing a detailed introduction of their thesis topic and describing preliminary research results. Proposal seminars were evaluated by all faculty and instructional staff in the audience using a numerical evaluation form (see attached). Written comments were also collected. Evaluation results were returned to both student presenters and their respective research advisors. Evaluations were also collected and discussed by the chemistry department graduate committee.</td>
<td>This activity primarily addresses program objective <strong>d</strong>, and secondarily addresses objectives <strong>a</strong>, <strong>b</strong>, <strong>e</strong>, and <strong>h</strong>.</td>
<td>15 graduate student presentations were evaluated during 2015-2016. On average, each student received ~8 evaluations from faculty/staff in attendance. Evaluations were generally very positive, however a recurrent critique involved the need for students to more clearly articulate the specific goals and objectives of their projects. This critique was particularly evident in written comments from evaluators. Overall, it suggested student presenters need to strike the right balance between describing the ‘big picture’ of their work versus presenting technical details/results. This feedback has been conveyed to faculty advisors and students. In addition, a shortened seminar format has been adopted with an increased emphasis on describing project goals and establishing the background for graduate research projects.</td>
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**Improvements Implemented Since Last Report:**

2015-2016 represents the first formal assessment for the MS in chemistry program. As described above, improvements for 2016-2017 will include a revised rubric for evaluating graduate seminars, and the continued use of a shortened seminar format with an emphasis on research project goals and design rather than research results. In addition, assessment activities for the remaining SLO’s will be implemented.
Graduate Program Self-Assessment Report Rubric

The Graduate Council, in coordination with the University Accreditation and Assessment Advisory Committee (AAAC), will use this rubric in responding to the program assessment reports. Keep these criteria in mind as you complete your report. As part of your Closing the Loop report, please complete a self-assessment using this rubric. Simply circle whether you believe your Student Learning Assessment is at Best Practice, At Standard, Developing, or Unacceptable using the descriptions.

<table>
<thead>
<tr>
<th></th>
<th>Best Practice</th>
<th>At Standard</th>
<th>Developing</th>
<th>Unacceptable</th>
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<tbody>
<tr>
<td><strong>Level of Faculty Participation</strong></td>
<td>Broad faculty participation</td>
<td>Select faculty participation with departmental discussion.</td>
<td>Select faculty participation.</td>
<td>Minimal faculty participation.</td>
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<td><strong>Frequency and Meaningfulness of Assessment</strong></td>
<td>1. All degree or program SLOs assessed twice in a 5-year cycle corresponding with the Graduate Council program review schedule. 2. Assessments meaningfully connected to improvement efforts.</td>
<td>1. All degree or program SLOs assessed at least once in a 5-year cycle corresponding with the Graduate Council program review schedule. 2. Assessments meaningfully connected to improvement efforts.</td>
<td>Some SLOs not assessed, but selected SLO assessments meaningfully connected to improvement efforts.</td>
<td>Some SLOs not assessed, and elected SLO assessments not meaningfully connected to improvement efforts.</td>
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<tr>
<td><strong>Measures</strong></td>
<td>1. SLO assessment includes meaningful direct measures with threshold designations. 2. Indirect measures meaningfully supplement direct measures.</td>
<td>SLO assessment includes 1 meaningful direct measure for each outcome.</td>
<td>SLO assessment includes direct measures but they are not sufficiently meaningful.</td>
<td>No direct measures of student learning.</td>
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<tr>
<td><strong>Reporting Results</strong></td>
<td>Reported results detail meaningful conclusions sufficient to support data-informed and measurable improvements.</td>
<td>Reported results permit actionable improvements but in a manner that is inferential rather than measurable.</td>
<td>Reported results are not sufficiently specific or meaningful to permit data-informed improvements.</td>
<td>No results reported.</td>
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<tr>
<td><strong>Stage of Implementation of the Improvements</strong></td>
<td>Improvement is fully implemented; program is prepared to evaluate the effect of the improvement upon student achievement.</td>
<td>Improvement is largely implemented (e.g., proposed curriculum change was approved by the department/college and sent to the Graduate Council/ACC).</td>
<td>Program has a plan for implementing the improvement.</td>
<td>Program has no plan for implementing the improvement.</td>
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