Student Learning Outcomes/Objectives, with Any Associations and Related Measures, Targets, Findings, and Action Plans

SLO 1: Advanced understanding of concepts in physical chemistry
Graduate students will acquire an advanced understanding of concepts in physical chemistry. An advanced understanding includes the ability to apply knowledge and analyze information.

Related Measures

M 1: Physical chemistry course final exam
Final exam in a required graduate level physical chemistry course (CHEM 5310 or 5311).
Source of Evidence: Academic direct measure of learning - other

Target:
75% of MS students will achieve a C or higher on the final exam in their required Physical Chemistry course (CHEM 4310G).

SLO 2: Advanced understanding of concepts of subdisciplines outside of physical chemistry
Graduate students will acquire an advanced understanding of concepts in a minimum of 2 subdisciplines outside of physical chemistry (Analytical, Biochemistry, Inorganic, Organic, Materials, Medicinal) through completion of graduate level coursework. An advanced understanding includes the ability to apply knowledge and analyze information.

Related Measures

M 2: Successful completion of final exam
Final exams in required graduate level coursework.
Source of Evidence: Academic direct measure of learning - other

Target:
M.S. students will achieve a grade of C or higher on final exams in required coursework.

SLO 3: Chemical literature
Graduate students will be able to explain in technical written and oral formats an advanced understanding of a current topic in the chemical literature.

Related Measures

M 3: Graduate Seminar course
All graduate students will complete oral and written assignments in the required Graduate Seminar course.
Source of Evidence: Academic direct measure of learning - other

Target:
75% of M.S. students will achieve an average score of 3.5 out of 5 or higher across the 4 criteria in the rubric for oral performance and for written performance. Students will be assessed by a jury of faculty members.

SLO 1: Understanding of concepts related to their thesis research and area of specialty
Graduate students will acquire an advanced understanding of concepts in areas related to their thesis research and area of specialty and will be capable of applying these concepts in order to analyze new topics or material.

Related Measures

M 1: Research project
All graduate students in the chemistry M.S. thesis program will complete a research project, requiring the collection and interpretation of data. This effort will result in the construction of a thesis, which will be orally defended in front of the thesis committee.
Source of Evidence: Project, either individual or group

Target:
75% of students will receive an average score of 3.5 out of 5 on the seven criteria included in the rubric based on jury judging by the thesis committee (appointed by the graduate school). The committee will evaluate if the work is scientifically sound, noteworthy, and presented well in oral and written format.

M 2: Abstract
Each student in the M.S. with thesis option achieve sufficient research competency to allow presentation of research results at a regional, national, or international conference in chemistry.
Source of Evidence: Academic direct measure of learning - other

Target:
75% of students will have sufficient research results, understanding of their work, and oral competency to present the results at a professional meeting. The quality of research work and level of understanding will be jury judged based on the thesis defense or general exam utilizing the relevant items from the evaluation rubric. A score of 3.5 out of 5 on the relevant rubric items will signify competence.

**SLO 2: Physical chemistry & the subdisciplines**
Graduate students will acquire an advanced understanding of concepts in physical chemistry and a minimum of 2 subdisciplines outside of physical chemistry (Analytical, Biochemistry, Inorganic, Organic, Materials, Medicinal) through completion of graduate level coursework. An advanced understanding includes the ability to apply knowledge and analyze information.

**Related Measures**

**M 4: Physical chemistry course final exam**
Assess performance in graduate level physical chemistry course using final exam
Source of Evidence: Academic direct measure of learning - other

**Target:**
75% of M.S. students will score 70% or higher on the final exam in a required graduate level physical chemistry course (CHEM 5310 or 5311).

**M 5: Successful completion of final exams**
Assess courses taken and ensure successful completion of final exams
Source of Evidence: Academic direct measure of learning - other

**Target:**
75% of M.S. students will score 70% or higher on final exams in required graduate level coursework.

**SLO 3: Competent instructors**
Graduate students will develop skills to be competent instructors of undergraduate students, including the ability to explain and demonstrate general chemistry or organic chemistry content.

**Related Measures**

**M 6: Teacher assistant**
Graduate students will have the opportunity to serve as TAs for undergraduate courses.
Source of Evidence: Academic direct measure of learning - other

**Target:**
85% of the undergraduate students will achieve a C or better in their lab courses taught by TAs.

**M 7: Student evaluations**
Student evaluations of teaching assistants in general chemistry and organic chemistry labs.
Source of Evidence: Student course evaluations on learning gains made

**Target:**
Graduate students serving as TAs will receive positive ratings from 80% or higher of the students whom they have instructed.

**SLO 4: Chemical literature**
Graduate students will be able to explain and analyze in technical written and oral formats an advanced understanding of a current topic in the chemical literature.

**Related Measures**

**M 8: Graduate Seminar course**
All graduate students will complete oral and written assignments in the required Graduate Seminar course.
Source of Evidence: Academic direct measure of learning - other

**Target:**
75% of MS students will achieve an average score of 3.5 out of 5 or higher across the 4 criteria in the rubric for oral performance and for written performance. Students will be assessed by a jury of faculty members.