

PhD Students: Learning Goals and Assessments

The Doctoral Program of Chemistry & Chemical Biology trains students at the highest level to assume leadership roles in all aspects of biological and physical sciences that address questions and issues related to chemistry and chemical biology.

Learning Goal #1 for PhD Students: Attain distinct ability, scholarship, research and leadership skills in all areas of chemistry and chemical biology

Assessment of student achievements in goal #1:

- Grades in graduate courses
- Qualifying examinations assessing depth and breadth of knowledge
- Review by faculty of student progress with close advising and mentoring
- Placement in positions and careers that require ability and scholarship in those aspects of biological and physical sciences that address chemical and biochemical issues and questions

Role of the program in helping students to achieve goal #1:

- Close advising to assure that students are being prepared in a coherent and academically rigorous fashion
- Effective monitoring of student progress that includes annual reports on research progress from the student to the thesis committee and comments of the thesis committee about the student's progress
- Evaluations of teaching effectiveness of instructors in graduate courses, and if effectiveness is below expectations, work with instructors to improve effectiveness
- Periodic review of curricular offerings and assessment tools by program faculty, and in consultation with the Office of the Dean of the School of Graduate Studies and/or the unit dean

Learning Goal #2 for Ph.D. Students: Engage in and conduct original research

Assessment of student achievements in goal #2:

- Preparation/defense of Ph.D. dissertation proposal
- Assessment of Ph.D. dissertation quality
 - Public defense of dissertation
 - Critical reading of dissertation by departmental graduate faculty committee members and a committee member from outside of the chemistry graduate program
 - Submission and acceptance of peer-reviewed articles and conference papers based on the dissertation



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- Achievement of students as evidenced by professional placements, selection for conference presentations, peer-reviewed publications and individual grant attainment

↪ *Role of the program in helping students to achieve goal #2:*

- Provide early introduction to research methods, research ethics and opportunities for research
- Provide opportunities to present research and receive feedback
- Maintain adequate funding levels through the research phase
- Provide comprehensive advising and assist in the identification of mentors
- Award students for research accomplishments

Learning Goal #3 for Ph.D. Students: Prepare to be professionals in careers that require training at the highest levels in chemistry and chemical biology

↪ *Assessment of student achievements in goal #3:*

- Review evidence of presented papers, publications, and professional networking
- Evaluations of teaching effectiveness of graduate student instructors
- Collection of placement data
- Review by external advisory committees, both inside of and external to the University
- Survey alumni/ae

↪ *Role of the program in helping students to achieve goal #3:*

- Develop discipline-specific programs in concert with the Teaching Assistant Project and/or Carnegie Academy for Scholarship on Teaching and Learning programs
- Encourage enrollment in Introduction to College Teaching I and II
- Encourage participation in professional development programs in such areas as human subjects research, library use, course management software, interview skills, presentation skills, development of CVs, use of research tools, training in the responsible conduct of research, and proposal writing
- Host discipline-specific training when appropriate
- Teach students how to do assessments in their future professional capacities
- Provide flexible options for students with interdisciplinary interests related to chemistry
- Develop or enhance programs related to job and networking skills, including activity in professional societies and preparation for necessary certifications
- Acquaint students with non-academic career opportunities

The leadership of the Department of Chemistry & Chemical Biology will regularly review the structure and content of the program and the feedback received from assessments and surveys. These reviews will be used to provide the best possible education to students in order to meet the needs for highly trained individuals in the biological and physical sciences that address questions and issues related to chemistry and chemical biology.