BIOCHEMISTRY LEARNING GOALS AND ASSESSMENT

The doctoral program in Biochemistry trains students for senior research positions in industry or government settings, or for academic careers in a college or university setting where they would be expected to teach and/or conduct research.

Learning Goal 1 for Students: To develop proficiency in the critical analysis of scientific research.

Assessment of student achievement of Goal 1:

- Grades in graduate courses.
- Qualifying examinations assessing depth and breadth of knowledge.
- Faculty review of student progress with close advising and mentoring.
- Demonstrate ability to read and critique scientific literature in seminar classes.

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 in thesis committee’s annual review.
- Require annual reports on research progress from both the student and the student’s research mentor.
- If effectiveness is below expectations, work with research mentor and/or course instructors to improve effectiveness

Learning Goal 2 for Students: To pursue and solve a novel research problem of interest to both the student and mentor.

Assessment of student achievement of Goal 2:

- Preparation of and defense of Ph.D. dissertation proposal.
- Assessment of quality of Ph.D. research by the thesis committee.
- Public defense of dissertation.
- Critical reading of dissertation by committee of graduate faculty members and a committee member from outside of the Biochemistry graduate program.
Role of the graduate program in helping students achieve Goal 2:

- Provide early introduction to hypothesis development, research methods and opportunities for research.
- Provide opportunities to present research and receive feedback.
- Advocate for adequate funding throughout the research phase.
- Employ a standard form for thesis committee members to evaluate the quality and progress of dissertation research.

**Learning Goal 3 for Students: To produce publishable research in the field.**

Assessment of student achievement of Goal 3:

- Submission and acceptance of peer-reviewed articles and conference papers based on the dissertation research.
- 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 achieve Goal 3:

- Encourage participation in classes on proposal writing
- Host discipline-specific training when appropriate
- Teach students how to do assessments in their future professional capacities
- Employ a standard form for thesis committee members to determine the likelihood that a student’s research will be publishable.

**Learning Goal 4 for Students: To follow ethical principles of the discipline for citing sources, using human subjects, and working with colleagues.**

Assessment of student achievement of Goal 4:

- Course grade in Ethics class in the responsible conduct of science.
- Assessment of quality of Ph.D. dissertation.

Role of the program in helping students achieve Goal 4:

- Require Ethics class in the student’s first academic year.
• Employ a standard form for thesis committee members to evaluate student’s ability to cite sources appropriately.

**Learning Goal 5 for Students: To teach and mentor effectively.**

Assessment of student achievement of Goal 5:

• Review of annual research presentations as part of yearly committee meetings.

• Research mentor’s evaluation of graduate student’s training of undergraduate researchers in lab setting.

• Evaluations of teaching effectiveness of graduate teaching assistants in undergraduate classes.

Role of the program in helping students achieve Goal 5:

• Require attendance at classmates’ annual research presentations.

• Acquaint students with academic career opportunities.

• Employ a standard form for thesis committee members to evaluate oral and written communication skills.