Core Curriculum

Students in the Bioscience PhD Programs enroll in a standard curriculum that has been designed to provide a solid background in key areas; provide options in tailoring coursework to specific interests; and teach independent, critical thinking skills, and grant writing.

Foundations of Molecular Biology: MBIOL 6500 (3 credits, half semester)

All Molecular Biology Program students will enroll in MBIOL 6500 - Foundations of Molecular Biology during the first half of Fall semester. This class will offer all students a solid foundation in nucleic acid metabolism, gene expression, protein structure and function, genetics, and cell biology to begin the first year of graduate school.

Foundations of Biological Chemistry: BLCHM 6500 (3 credits, half semester)

All Biological Chemistry students will enroll in BLCHM 6500 - Foundations of Biological Chemistry during the first half of Fall semester. This class will offer all students a solid foundation in nucleic acid biochemistry, protein structure and function, bioorganic, and biophysical chemistry to begin the first year of graduate school.

Critical Thinking in Research: MBIOL/BLCHM 6200 (2 credits, half semester)

In order to teach the skills required to be a successful independent scientist, this course will instruct students on how to digest and analyze papers and problem solve - both of which involve reviewing and applying material from previous core courses. The instructors will develop the specific course content, and topics may include How to read a paper (read at home, discuss in class); Survey of the core services; and Problem solving with open-ended problems posed on real-life or made-up situations.

Guided Proposal Preparation: MBIOL/BLCHM 6300 (3 credits, full semester)

To prepare students for their thesis research, prelims, and qualifying exams, students will enroll in a guided proposal preparation course in the second half of the Spring semester that builds on their experience earlier in the semester (critical reading of primary literature and problem solving). The guided grant writing course will provide an opportunity for students to create an original research proposal by critical review of other grants, training in hypothesis generation, scientific writing, and experimental design. The written original grant proposal will be used as a basis for an oral capstone examination by a faculty committee.

- **Facilitators help a small group of students develop proposals during the second half semester**
- **Examiners serve on ~5 capstone exams**

Intro to Biostatistics and Probability: MBIOL 6490 (2 credits, full semester)

Introduction to Biostatistics and Probability for Biosciences focuses on a broad introduction to methods for statistical analysis of biological and biomedical data with emphasis on the fundamental concepts of probability analysis and statistical inference and the practical application of these concepts to experimental design and data analysis.