PhD in Bioinformatics Committee Formation & Exam Requirements

Advising: Upon admission students will be assigned an advisor who can guide their curriculum and plan of study. Students are then required to identify a research advisor, who will also serve as their academic advisor for the remainder of their studies, by the end of their third semester.

Committee: Examination committees must be composed of a minimum of five faculty members per graduate college guidelines. IGP-BCB students’ committees must include: their research Advisor and at least 2 program affiliated faculty from any of the following disciplines: Engineering, Genetics, Biology, Biosciences, IGPI. At minimum, two committee members must have never coauthored a peer reviewed journal article with the student.

Qualifying Exam: To be completed by end of 3rd semester. Students must choose one of the following formats.

A) An NIH-style proposal (typically proposed by the student and advisor; may also be assigned by the committee). Students are encouraged to submit as a predoctoral NIH Fellowship (F31). The purpose of this individual predoctoral research training fellowship is to provide support for promising doctoral candidates who will be performing dissertation research and training in scientific health-related fields relevant to the missions of the participating NIH Institutes and Centers (ICs) during the tenure of the award. These Fellowships allow students to develop a research idea and provides support for typically 2-3 years. The advisor and/or committee may decide to have on- or off-topic proposals. The committee (which includes the advisor), has final say by majority vote. This gives students a year to polish and improve the proposal for submission to the NIH (http://grants.nih.gov/training/F_files_nrsa.htm)

B) Open-ended research question:
Students who select this option will be assigned, by their examining committee, an open-ended problem in the area of the student's intended thesis research. Ideally, the student will be presented with this problem no later than the end of the Spring Semester of the first year of study, along with a designated date/time for the examination (typically at the beginning of the Fall semester), and the student will be expected to develop a solution during the summer. On the assigned date, the student will submit a written response to the assigned problem. The student will be expected to defend this response at an oral examination during the fall semester before the Examining Committee. The actual format of the response will depend on the specific problem assigned, and be specified by the Committee in the problem description, but is expected to involve the application of bioinformatics techniques towards the solution of a specific problem within the student's research area. Under certain circumstances, these guidelines with respect to the problem due date and oral examination might require modification to suit extenuating circumstances of the student or the Committee. Successful completion of the PhD QE is required before a student is to be considered a PhD graduate student. Students will have two chances to pass the PhD QE. If
students receive an evaluation of unsatisfactory on their first QE attempt, a different topic will be selected for the open-ended problem.

PhD Comprehensive Exam: On-topic thesis proposal
After 2-3 years of working with a research advisor on a problem in Bioinformatics, the size and scope of the project becomes evident to the student (as well as the advisor). To clearly define the problem (or hypothesis) under examination, and describe a clear, logical process to solve that problem (or test the hypothesis), the student will develop a written document describing the problem/hypothesis and solution/experiments. This document is the PhD Comprehensive Exam. The PhD Comprehensive Examination (CE) consists of a proposal (in the style of an NIH grant proposal) outlining the student’s PhD research. It is expected that the PhD CE will be completed one year after the PhD QE, but might be completed later at the discretion of the student's Examining Committee. The quality of the proposal will be determined through its assessment by the Examining Committee, and a formal oral presentation is required. The final document will consist of a 12 page NIH-style grant application on the thesis plus a comprehensive literature review (no page limit).

The proposal should include the following:

1. TITLE PAGE
   Student name
   Committee members and their academic departments
   Committee chair (research adviser)

2. RESEARCH PROPOSAL -
   Provide a detailed description of the research, including:
   Specific Aims
   Background and Significance
   Preliminary Studies (optional, but recommended)
   Research Plan (include expected results and their significance, and a discussion of potential pitfalls / workarounds)

3. TIMELINE
   Provide a specific schedule for the completion of the proposed studies, with explicit reference to the work proposed in the Research Plan.

4. BIBLIOGRAPHY - A complete list of cited references.

Final Examination (Thesis Defense): Upon satisfactory completion of the PhD thesis, the student will submit a final draft of the dissertation to the members of their Examining Committee. Following an assessment of the dissertation by the student's Examining Committee, the student will defend it orally in an open and public forum. The Examination Committee may then ask additional questions in a meeting between the candidate and the committee. Satisfactory performance in this final examination will result in a recommendation by the Committee to the Graduate College that the student be awarded a PhD in Interdisciplinary Graduate Program in Bioinformatics and Computational Biology.