Preliminary Examinations (Prelims) 2008

The aims of the preliminary examination in Bioinformatics are two-fold. The first is to demonstrate that students have developed the ability to analyze a scientific problem and develop appropriate strategies to carry out a research plan, and the second is to demonstrate that students have the fund of knowledge in Bioinformatics that they will need to carry out their thesis research. The preliminary examination in Bioinformatics consists of a written and oral component. For the written portion of the exam, each student will independently of their proposed thesis advisor prepare a condensed version of an NIH research proposal on a subject that may be somewhat related to, but is not, their thesis project. The oral portion of the exam will be divided into two **roughly equal** sections. First, the candidate will defend their research proposal, and second the committee will question the candidate on general subject matter that the committee feels is relevant to the candidates proposed area of research.

Eligibility

Students with a master's degree in a relevant subject are eligible to take the preliminary examination if they will have completed 18 units of course work at the University of Michigan by the end of the term during which the exam is held. Students who do not have a master's degree in a relevant subject must complete 36 units of course work at the University of Michigan including the term during which they take the preliminary examination.

The student must have a clearly identified thesis director and the thesis director-to-be must have discussed his or her responsibilities towards the student over the course of the student's future career in the Program with the Program Director before the examination can proceed.

Guidelines for formulation of the research proposal:

The research proposal must state and test a clearly defined hypothesis.

Students are encouraged to seek information from a variety of sources, including the primary literature, seminars, and discussions with other students, post-doctoral fellows, and faculty. However, the development of the research aims and the experimental approach of the proposal are expected to reflect independent thought and critical analysis.

Thesis advisors should expect that students will require a six week period of substantially protected time to devote to the preliminary exam.

Choice of Topic and Approval

The student is responsible for selecting a topic and writing a one-page abstract describing the proposed research. The Graduate Affairs Committee will approve topics and proposal abstracts.

Examining Committee

The Preliminary Examination Committee must include at least four faculty members who are affiliates of the Bioinformatics Program. The committee will be composed by the student and must be approved by the Graduate Affairs Committee.

The Chair of the Preliminary Examination Committee will be selected by the Graduate Affairs Committee out of the four faculty members the student selects to be on their Preliminary Examination Committee. If this has not been done officially by the GAC before the examination, the sitting committee will elect one of themselves to be the chair before the examination begins.

In the event that a topic extends beyond the expertise of the Program faculty, a faculty member who is mutually agreeable to the student and the Graduate Affairs Committee will be selected.

The Preliminary Examination Committee is responsible for reading the written proposal, meeting with the student to critique his/ her proposal, and assessing his/ her general knowledge and preparation for carrying out doctoral research in the area in the proposed field. The Preliminary Examination Committee decides to pass the student or make recommendations for a remedial course of action if the exam is not satisfactory.

The Chair of the student's Preliminary Examination Committee is responsible for providing the Program with a one page summary of the Committee findings and recommendations.

Scope and Format of the Written Proposal

Standard grant format: Abstract, Specific Aims, Biological Significance, and Experimental Design.

Design a project which one person could complete in 2 to 3 years.

Two Specific Aims are acceptable.

Twelve page limit excluding references, 12 pt. Times-roman font, 1" margins.

The requirements for the written preliminary examination proposal in bioinformatics are that it is independent work by the student, that it demonstrates the student's ability to identify a scientific problem, formulate testable hypotheses, and that the student can develop a research plan to address these questions. The subject of the proposal can be in the general area of the student's thesis project, but since the thesis project often reflects substantial input from the mentor, the prelim proposal should not actually be the thesis proposal.

The written proposal is expected to be approximately 12 pages in length and to follow a grant (NIH form PHS-398) format. Refer to NIH form PHS-398 for a description of what is expected in the scientific sections. You can use single-space 11 pt. Arial font if you need the space to say what you need to say, but remember that your committee will appreciate good ideas stated concisely. You also need to show that you are aware of relevant literature. References listed are not included in the 12 page limit.

You do not need to prepare a budget, budget justification, research environment or the other administrative forms and approvals. You need to propose feasible research projects so some general awareness of the financial implications of your proposal is appropriate.

Results drawn from the literature can be used for preliminary data. The emphasis in the proposal should be demonstrating scientific reasoning, experimental design and the ability to analyze data.

The Oral Examination

There are two requirements for the oral examination. First, the student should be able to present and defend their research proposal to the satisfaction of the committee. Second, the student should demonstrate to the committee that their fund of knowledge has prepared them to undertake independent doctoral research in their chosen area.

Technical details of procedures should not be a major focus of the examination (e.g. if an experimental protocol is used by several groups in the literature, students need not be responsible for the details of the experimental protocol, but they should know the underlying principles of the assay).

Bioinformatics is a multidisciplinary field. Core areas of knowledge include molecular biology; macromolecular structure; databases and algorithms; statistics and pattern recognition; and system modeling. Students are not required to take courses in each area if waived, but they are expected to acquire a level of knowledge in these areas relevant to their thesis research. The committee should place greatest emphasis on knowledge and skills applicable to the topic a student has chosen for their thesis work.

Time Table

First Week of February:

Student submits a one-page abstract and the names of five faculty members who the student feels are relevant for the exam (dissertation advisors should not be on the prelim committee) to the Student Services Representative.

Week One:

Graduate Affairs Committee approves the topic and assigns the members of Examining Committee and selects the Chair of the Committee.

Week Four:

Student submits written proposal to the entire Exam Committee and to the Student Services Representative.

Examining Committee evaluates written proposal.

If proposal is judged indefensible, the Chair conveys specific recommendations from the Committee for improvements or modifications to the student and to the Student Services Representative.

Week Five:

Oral examination by committee covering both the proposed research plan and area the committee feels are relevant to the student's future research.

Examining committee will debrief student's mentor and the student.

Chair of the Committee will prepare a one page detailed review of student's performance to the Student Services Representative.

Please note that ALL prelim activities should be completed by April 30, 2007. Deviations from the schedule above must be approved by the Graduate Affairs Committee in advance.