CIS PhD Prelim Policy Document

PhD Preliminary Breadth Requirement

1) Each student must take 5 breadth courses, subject to the following constraints:

a) At least one of "CISC 621: Algorithm Design and Analysis" or "CISC 601: Elements of the Theory of Computation" must be included.

b) At least one course from each **breadth area** must be included.

The **breadth areas** and the **breadth courses** included in each area are as follows:

Area 1: Theory

- CISC601: Elements of the Theory of Computation
- CISC604: Logic in Computer Science
- CISC621: Algorithm Design and Analysis

Area 2: Systems and Networks

- CISC650: Computer Networks II
- CISC662: Computer Systems: Architecture
- CISC663: Operating Systems
- CISC672: Compiler Construction

Area 3: Software

- CISC640: Computer Graphics
- CISC675: Object Oriented Software Engineering
- CISC681: Artificial Intelligence

Area 4: Information

- CISC636: Bioinformatics
- Either Machine Learning or CISC683: Introduction to Data Mining (i.e., at most one of these two courses can be used to fulfill the breadth requirement)
- CISC637: Database Systems
- CISC642: Introduction to Computer Vision

The list of breadth courses is subject to change as approved by the CIS faculty.

2) A student must obtain an average GPA of 3.5 or higher over these 5 breadth courses. Courses that will be counted toward this requirement must be pre-declared as explained below.

3) At the start of every semester, a student will have to declare the courses he/she wishes to take that semester for satisfying the Prelims course component
(See Breadth Prelims Course Registration Form)
A student can change courses to be counted for the Prelims course component during the free drop/add period but ***not*** beyond that time. The student can also drop a course for this component during the free drop/add period. (See Breadth Prelims Course Registration Form). After this period, the course will be counted toward the Prelims course component and the

grade in that course will be counted toward the required average of 3.5. A grade of L or W will count the same as an F grade.

4) None of the courses counted toward the Prelims course component can be a repetition of a course previously taken or of a course previously audited. If a student takes the same course more than once, only the grade on the ***first*** attempt may be counted towards the Prelims course component. The only exception is as specified in *item 6)* below.

5) Once the 5 required Prelims courses are completed, a student who has a grade point average of less than 3.5 on these courses may take, with the advisor's approval, at most one additional course from the approved list of Prelims courses, or petition the GPC to use a course already taken from that list. In this case, the additional course may be used to substitute one of the original five courses making sure that the five courses used for the Prelims satisfy all the breadth requirements. This additional course may be a repeat of the course being substituted, with approval of the instructor teaching the repeated course. In exceptional situations, with strong advocacy from the advisor and with justifiable reasons, the GPC may allow one extra semester beyond the four semesters to complete this sixth course.

Opting Out: See **Prelims Course Opt-out** link for details.

PhD Preliminary Research Requirements

1) Advisor: To complete the PhD Preliminary Exam research component, a student must find a CIS faculty member to be his/her advisor and complete a research project as described below under the supervision of the advisor. The advisor must be a tenure-track faculty member with a primary appointment in CIS. It is expected that the advisor will eventually become the student's thesis advisor.

2) **Committee:** Before starting on the research project, the student must form a committee, which will oversee and approve the project. The committee must be declared in advance and approved by the GPC; a committee member may be changed only with approval of the GPC and for valid reasons only. The advisor is a member of this committee. The committee will have at least one more member in addition to the advisor and co-advisor if any. At least one of the additional members must also be a tenure-track faculty member with a primary appointment in CIS.

3) **Research Project:** The research requirement should be a uniformly rigorous requirement for all students taking the Prelims Exam. Its purpose is to assess the student's ability to conduct and to formally write and report basic level research. The research does not have to be novel. It needs to show that the student can understand an area, synthesize material he/she reads within that area, and come up with his/her ideas – either as a new project or as a synthesis pointing out pros and cons of the current state-of-the-art and future directions.

The research project must include a thorough literature search and a summary of the current state of knowledge in the area. In addition, it must also include some original contribution. The exact form of this contribution may vary from one student to another. Examples include:

- Application of existing ideas to new examples

- The development of a prototype (software) tool which realizes existing ideas or extends them in some way
- Some theoretical or mathematical extension of existing ideas
- A novel analysis of existing data
- An original synthesis of existing ideas
- A simple experiment

4) **Research Proposal and Report:** The student in consultation with the committee will prepare a Research Proposal at the start of the research project. This proposal must be no more than two pages long, not including the bibliography. It should contain a brief summary of the project, motivation for the work, a description of what work will be performed, and the expected results.

At the end of the project, the student will prepare, under the supervision of the advisor, a written Research Report describing the results of the project. The Research Report must be no more than 20 pages long, not including the bibliography, and it must adhere to common standards for a good technical report. These include: Good use of language and grammar; proper attribution to source and proper use of citations; proper document structure (Introduction, Conclusions, and the sections in between); proper use of figures, tables, captions, and references to such objects from the write-up.

The report should not simply be a recycled version of a paper that has been submitted for publication or that has other co-authors. Instead, the student should make an effort to write a report that addresses the issues described in the research proposal.

5) **Oral Exam:** The student must present the results of the research project and results in a 30-45 minute presentation given during an Oral Exam. The Oral Exam should be scheduled as a SIG presentation, whenever possible, and will typically take about 1.5 hours in total (including the student's presentation). It should be open to all and should include the committee members in the audience, although the committee members can ask the audience to leave for part of the examination. Research Prelims Evaluation Form.

6) Timeline: All Prelims Exam research projects will be conducted during regular semesters, either Spring or Fall. The student must provide a research proposal and decide the date, time, and place of the oral exam in consultation with the committee and provide this information to the GPC Chair before the end of Week 6 of the semester. All oral exams will be scheduled during the last 5 weeks of the semester (up to the last day of final exams). To the extent possible, they will be advertised as a SIG presentation in an appropriate SIG. The final report of the student must be given by the student to all committee members and published online at least 2 weeks before the date of the oral exam.

Nothing in this requirement prevents a student from starting work on the research project in consultation with his/her advisor in advance of the semester in which the project will be conducted. In fact, students are encouraged to lay the groundwork for their projects before the semester starts.

7) **Evaluation:** The student's committee will evaluate the written report and the oral exam using a checklist with numeric or letter grades. This checklist will be developed by the GPC. Each member of the committee must independently assess the student's performance using this

checklist and make a recommendation on Pass / Conditional Pass / Fail of the student. These evaluations and recommendations are sent to the GPC by the advisor immediately after the oral exam. A committee member may recommend a Conditional Pass in situations where the committee member feels that there was a deficiency in the written report or the oral exam or both which may be corrected by the student within a four-week period and which is not serious enough to warrant a Fail.

8) A student who anticipates not meeting the timeline specified in Item 6 above or failing the exam due to serious illness, injury, or other extenuating circumstances may request either an extension or a second opportunity to take the research component. The student should submit a letter to the department's Graduate Program Committee as early as possible – and before the end of the two-year period, detailing the issue and clearly stating the requested accommodation.
The GPC will consider the request, and may either reach a decision on the matter, or bring it up in the faculty meeting in which the student's work is discussed (see next part, under Final Result of the Preliminary Exam)

9) A student who has completed an MS thesis in our department will be considered to have completed the research component of the Prelims Exam. The final Pass/Fail decision for this student on the Prelims Exam will still be made in a faculty meeting as described in the section below.

Final Result of the Preliminary Examination:

1) After the end of each semester, there will be a faculty meeting to decide the final result of the Prelims Exam for each student who took the research component of the exam during that semester. The faculty decision will take into account the student's performance on both components of the Prelims Exam, namely the course component and the research component. The faculty will consider and discuss

a) the recommendations made by the student's research exam committee members on the research report and the oral exam,
b) the student's performance in all courses taken by the student including the courses taken for the Prelims course component, and
c) the support and willingness of a faculty member to advise the student for his/her PhD dissertation.

The faculty will then vote and decide on which students failed and which students passed the Preliminary Exam. In some cases, a Conditional Pass may be given (see below).

2) The result of the Preliminary Exam may have one of three outcomes: Pass, Conditional Pass, or Fail. If the result is a Conditional Pass, then the student is typically asked to revise the research report and/or re-take the Oral Exam within 4 weeks. In this case, the student's committee will issue fresh evaluations and recommendations on the report and oral exam, and these recommendations will be discussed in another faculty meeting. The faculty's decision on the retake will be either Pass or Fail.

3) If the original outcome is a Fail, or if the result of the revised exam is a Fail, a recommendation to dismiss the student will be made to the Office of Graduate Studies. In most cases, the student's funding – if provided thus far by the department – will be discontinued. In rare situations, upon advocacy of an advisor who is willing to work with the student, a second chance for the prelims research project may be granted by the faculty. This advisor may be the same as the advisor for the first attempt or may be a different advisor.

PhD Prelims Transition Policy

1. The new Prelims Exam requirements will take effect Fall Semester, 2016. All students entering the PhD program in the Fall Semester 2016 or later must follow these requirements.

2. Students who are enrolled in the PhD program prior to Fall'16 and who have not passed the Prelims Exam by September 1, 2016 will follow this procedure:

   a. The requirements for the course component of the Prelims Exam that were in effect prior to Fall'16 will continue to apply to these students.

   b. Students taking the research component of the Prelims Exam in the 2016 Spring Semester (and up to August 31, 2016) will continue to follow the requirements for the research component that were in effect prior to Fall'16.

   c. Students taking the research component of the Prelims Exam in the 2016 Fall Semester or later must follow all the new requirements for the research component. This includes following the timeline for the research component as described in the updated PhD Preliminary Research Requirements.

   d. The Pass/Fail decision for the Prelims Exam for all students taking the research component beginning in the 2016 Fall Semester will be made by the CIS Faculty in a meeting after the end of each semester.