

January 2, 2009

## **Joint Mathematics and Computer Science Ph.D.**

### **Program Overview**

This program is designed to allow a student to earn an interdisciplinary Ph.D. in the fields of Mathematics and Computer Science. The degree is one where the student makes meaningful research contributions to both fields.

The program will be overseen by a four-person committee (Oversight Committee), composed of 2 faculty members from each department. The Chairs of each Department shall be members of the Oversight Committee. The committee is a subcommittee of the Graduate Advisory Committee of each Department.

**Entrance to the Program:** A student may apply to the program by request, either as a new student or as a current student. Admission must be approved by the Graduate Chairs of both Departments. As a general guide, students considered for the program should demonstrate backgrounds of sufficient strength to warrant admission and financial support for the Ph.D. program of both departments.

Students entering the joint Mathematics/Computer Science Ph.D. program must have adequate background to successfully take the Qualifying Examination within three semesters of admission to the program. Background courses must include (equivalent UNL courses shown within parentheses):

Mathematics Courses: At least 15 semester credit hours of mathematics past calculus.

Computer Science Courses: computer organization (CSCE 230), discrete structures (CSCE 235), data structures and algorithms (CSCE 310), and programming language concepts (CSCE 322).

**Qualifying Examinations:** Students are required to pass a Qualifying Examination consisting of written examinations in both Mathematics and Computer Science. The mathematics portion will consist of a written examination in analysis (825-826) and the computer science portion requires the student to answer four questions from the computer science exam in 90 minutes, with further constraints described in the next paragraph.

The computer science exam consists of two parts. Part A contains eight questions on algorithms and the theory of computation, and part B consists of eight questions on operating systems and computer architecture. The student will be required to answer two questions from each part.

The standards for passing the Qualifying Examination are to be consistent with current practices from each Department. In particular, the student must pass at the "Qualifying Level" in both Computer Science and Mathematics.

Variations on this policy may be made with the approval of the Oversight Committee and Graduate Advisory Committee of each Department.

January 2, 2009

**Supervisory Committee:** The graduate chairs of each department shall jointly appoint a Supervisory Committee, thus both graduate committee chairs must sign the Appointment of Supervisory Committee form.

The committee must consist of an equal number of faculty from each department. An outside representative must be chosen from a department other than Mathematics or Computer Science and Engineering. The Supervisory Committee must have two co-chairs and two readers, with one co-chair and one reader from each department. A faculty member cannot serve as both a reader and a co-chair on the committee.

**Program of Study:** The program of study should consist of at least 90 hours, with at least 24 hours of course work from each department. No graduate level courses with 200 or 300 level counterparts are permitted. In addition, the program of study must include the following breadth requirements:

\* Mathematics Breadth Requirement: At least one of the following sequences: 817-818, 830-831, 842-843, 850-852, 871-872.

\* Computer Science Breadth Requirement: At least two courses in each of the systems, theory, and application tracks. Additionally, the student must attend at least 15 departmental colloquia or doctoral oral presentations during his/her PhD program; a signup sheet is used during these events as proof of attendance.

**Comprehensive Examinations:** The student's Ph.D. Supervisory Committee will determine the timing and the content of the Ph.D. Comprehensive Exam. The Supervisory Committee is required to follow Graduate College rules regarding the Comprehensive Exam, which may be found online at

[http://bulletin.unl.edu/graduate/Doctoral\\_Degree\\_Requirements#Comprehensive\\_Examination\\_and\\_Admission\\_to\\_Candidacy](http://bulletin.unl.edu/graduate/Doctoral_Degree_Requirements#Comprehensive_Examination_and_Admission_to_Candidacy)

The examination is to be administered by the Supervisory Committee and will be consistent with the current practices of each department.

**Dissertation:** Under the guidance of the Supervisory Committee, the student engages in research that culminates in a thesis which is expected to use significant tools from each discipline to make an original contribution to both areas.

**Final Oral Examination:** After the dissertation is completed, the student takes an oral examination according to the procedures described in the Graduate Bulletin.