Approved by the Faculty, April 2006

Department of Mathematics
Louisiana State University

Statement of Policy Concerning Graduate Studies

Part I. The Director of Graduate Studies, the Committee on Graduate Studies, and their Duties

A. There shall be a Director of Graduate Studies. There shall be a Committee on Graduate Studies, consisting of the Director, who shall be Chairman of the Committee; the Department Chairman, *ex officio*; and about five other members.

B. The Director and the other members of the Committee shall be appointed by the Department Chairman for staggered three-year terms. In order to be appointed to the Committee, a person must have been off the Committee during the previous year; except that this restriction will not apply in cases that involve the Directorship.

C. The Committee shall have general responsibility for the graduate program, subject to direction and reversal by the Graduate Faculty of the Department.

D. The charge of the Committee shall include the following particulars. In each matter, the Committee may delegate authority to the Director.

1. The Committee shall govern the conduct of the comprehensive, general, master's, final, and language examinations in a manner consistent with the regulations found elsewhere in the policy statement.
2. The Committee shall be responsible for the recruitment of graduate students, and for admissions decisions.
3. Well in advance of the beginning of each term-Fall, Spring, and Summer- the Committee shall make an estimate of the number of graduate students who will be enrolled during that term, and of their needs. The Committee shall then, in consultation with the appropriate Department officials and agencies, determine what courses will be offered and who will teach them. This decision shall be announced before the preregistration period for that term (and, in the case of the Summer term, by April). Furthermore, the Committee shall govern the adjustments in these plans that are made necessary by later developments.
4. In all questions that arise concerning degree requirements, the committee shall see to it that interpretations and particulars are provided in a timely fashion.
5. The Committee shall determine the acceptability of courses offered outside the department, and of student programs that include outside courses.
6. The Committee shall determine on an individual basis which faculty members from outside the Department may serve on thesis, dissertation, and examining committees, and as thesis or dissertation advisers.
7. The Committee's approval shall be required for a Mathematics graduate student to do a master's thesis or doctoral dissertation work under the full or partial direction of faculty outside the department.
8. In cases involving outside faculty, the committee shall see to it that the purposes and procedures of the examinations are clearly defined and explained.
9. The Committee shall review from time to time the need for changes in graduate course offerings, including changes to serve better the interests of students with outside minors, and when appropriate shall make timely recommendations to the Graduate Faculty of the Department.
10. This Policy Statement allows a minor in computer-related mathematics for students

desiring it, and provides that this minor may lead to thesis or dissertation work under the supervision of members of the Computer Science Department. Cooperation to such an extent with departments other than Computer Science shall require prior approval of the Graduate Faculty of the Department.

Part II. Requirements for Degrees

Part II should be understood to be supplementary to the provisions of the LSU Graduate Catalog with regard to degree requirements.

A. General Requirement

The Program of Study. In all degree programs, a student's curriculum must be approved each semester by the Director of Graduate Studies. The Director may allow the inclusion of courses outside the Department, but not normally more than a total of four during the first two years, except for the M.N.S. Degree.

B. Requirements for the degree of Master of Science

The M.S. degree in Mathematics (without a Concentration) is available as both a non-thesis and a thesis degree. In either case, M.S. students must complete the first semester core courses, which are Algebra (7200), Analysis (7311), and Topology (7510). The graduate course work requirement is 36 semester hours, of which at least 24 hours must be in mathematics, and at least 18 must be in mathematics courses numbered 7000 or higher.

- Non-Thesis M.S.: Every non-thesis M.S. student must pass the Department's Comprehensive Examination at least at the M.S.-Qualifying Level. This examination is described in paragraph III.A. Students must appear for the MS final exam.
- Thesis M.S.: This program is based on breadth of exposure in mathematics and requires an M.S. thesis. The graduate course work must include 6 of thesis credit (Math 8000). The student must earn at least a B-average in the three first semester core courses. The courses must include also at least three (3) 7000-level semester courses in mathematics in addition to the first-semester core courses, which may be selected from diverse areas of applied or pure mathematics. During the second semester of study, the student will need to form an Advisory Committee of at least three members of the graduate faculty in mathematics, one of whom will be the student's Thesis advisor and the Chair of the Committee. These faculty members must represent at least two of the following specialties: algebra, analysis, combinatorics, topology. With the Advisor's suggestion, and the Committee's approval, the student will select a thesis topic. The thesis must be an original and interesting contribution to the field, or a worthwhile and useful expository work, or a substantial application of mathematics. An oral thesis defense is required as the Final Examination for this program.

M.S. Degree with a Concentration: An M.S. degree in Mathematics with a Concentration (subject to approval by the Graduate Council) is not equivalent in breadth of study in Mathematics to the M.S. degrees without Concentration. It is intended as a more narrowly focused degree, presenting Master's level study of certain parts of mathematics together with other specialized topics, usually intended for students in a particular field in which upper level mathematics is applied. The Department will approve separate policy statements concerning the requirements for each proposed Concentration.

C. Requirements for the degree of Master of Natural Science

The graduate course work requirement for the M.N.S. degree in mathematics is 36 semester hours, of which at least 18 must be in mathematics, and at least 9 must be in an approved minor area other than mathematics. The remainder may be in any of the following areas: Biochemistry; Botany; Chemistry; Computer Science; Geography and Anthropology;

Geology and Geophysics; Marine Sciences; Mathematics; Microbiology; Physics and Astronomy; and Zoology and Physiology. At least 6 of the hours in Mathematics, and at least 9 in all of the 36 hours must be in courses numbered 7000 or above. Note: A maximum of 12 semester hours of computer science course work may be applied toward the M.N.S. degree. Every M.N.S. student must pass a Comprehensive Final Examination.

D. Requirements for the degree of Doctor of Philosophy

Specific requirements for the PhD in mathematics are the following:

1. Completion of the three first semester core courses (Algebra (7200), Analysis (7311), and Topology (7510)), as well as the student's choice of at least 4 of the second semester core courses, which are: Algebra I (7210), Measure and Integration (7312), Differential Equations (7320), Graph Theory and Combinatorics (7400), Topology II (7512), or Differential Geometry (7550). Three of these second semester core courses are normally taken in the Spring of the first year of study, and one more in the Spring of the second year. Exceptions are subject to the approval of the Graduate Committee.
2. Completion of one academic year of residency after a program of study is filed with the Graduate School.
3. Passing the written comprehensive examination at the PhD Qualifying Level. The student must pass this exam by the end of the spring semester of the second year, unless a postponement is allowed by the Graduate Committee.
4. Satisfying the departmental language requirement. (See IIID.)
5. Passing the oral General Examination. The student must pass this exam prior to the start of the fourth year of study, unless a postponement is allowed by the Graduate Committee.
6. Writing a dissertation and passing the Final Examination which is primarily a doctoral dissertation defense.

Part III. Examinations

The Committee on Graduate Studies shall be in charge of administering the examinations, shall decide the details of their content and conduct, and shall provide information in a timely fashion.

A. Comprehensive Examination

The first three subtests of the Comprehensive Examination are syllabus-based tests taken by all M.S. and PhD graduate students in mathematics covering the material commonly found in first semester graduate courses Math 7200, 7311, and 7510. The exam serves as the major portion of the Final Examination for the non-thesis M.S., and (with a higher passing score) as the first component of the PhD Qualifying Examination. The fourth subtest of the Comprehensive Examination is a written, in-depth test (longer than the individual first-semester core tests) covering the subject matter of one of the six second semester core courses, to be chosen by the student. Passing this fourth subtest, together with passing at the PhD Qualifying Level on the first three subtests, constitutes PhD Qualifying in Mathematics. The Committee on Graduate Studies shall determine how the exam shall be composed, administered, marked and evaluated. In making these decisions, the Committee shall consult those who have taught graduate mathematics courses during the previous three semesters or so. The Committee shall promulgate the appropriate information about the exam, including a syllabus to guide preparation.

B. MS Final Examination

This exam is offered once a semester. The student appears before the exam committee, which reviews the student's written exam results. The student is questioned and advised. Alternate opportunities for students to receive an MS final exam are at the discretion of the graduate

committee.

C. MNS Final Examination

The final examination for the MNS degree shall consist of about 5 modules of 1 hour duration each. Four of the modules shall consist of questions from the student's mathematics course work, including the required 6 hours of 7000 level mathematics courses. The remaining module will be provided by the student's minor department. The Committee on Graduate Studies shall determine how the exam shall be composed, administered, marked, and evaluated. In making these decisions, the Committee shall consult those who have taught the student, including the minor professor, during his or her MNS tenure.

D. General Examination

The General Examination, an oral exam for PhD students, tests a broad knowledge of mathematics plus sufficient knowledge in a specific field to begin dissertation research. The specific content of the general examination is established by the individual student's examining committee, which is appointed by the Department of Mathematics and the Graduate School. At the general examination, the examining committee shall ascertain whether the student has deficiencies in his or her broad mathematical training. The committee can recommend that these deficiencies be corrected. The General Exam should be completed before specialized dissertation research is started. It must be passed prior to the start of the fourth year of study, unless a postponement is allowed by the Graduate Committee. The examining committee shall determine whether the student passes or fails, and if he or she fails, whether or not he or she shall be allowed to take the exam again.

E. Foreign Language Examination

The Department of Mathematics requires ability to read mathematical texts in one of the three languages: French, German, or Russian. This knowledge can be demonstrated in any of the following ways:

1. Passing an examination administered by the Department of Mathematics. The departmental foreign language exam is a one hour written exam in which the student is asked to translate, with the aid of a dictionary, a few pages of mathematical literature in one of the above languages.
2. Passing either French 1020 or German 4005. These courses are designed to develop reading knowledge of technical literature.
3. Taking at least 13 semester hours in the language, with a grade of at least "B", and with the last course being taken within the last five years.
4. Exemption from the language requirement in their native language for students whose native language is French, German, or Russian.

The language requirement must be met before a student may take the General Examination.

F. Final Examination

This oral examination for PhD candidates is primarily a doctoral dissertation defense.

Part IV. Graduate Minor in Mathematics

The requirements for a student in another graduate field to obtain a graduate minor in mathematics are as follows:

1. **Master's Degree:** To obtain a minor in mathematics, a master's degree student in another

field must take nine hours of graduate credit in mathematics, with at least three hours credit in mathematics courses numbered above 7000.

2. **PhD Degree:** To obtain a minor in mathematics, a PhD student in another field must take twelve hours of graduate credit in mathematics, with at least six hours credit in mathematics courses numbered above 7000.

Note: Math 4037 and 4005 do not count towards graduate credit for a mathematics minor.

A. *Suggested sequences for minors in mathematics.*

The following is a list of some possible sequences of courses to be followed by Ph.D. minors in mathematics. The list is not inclusive, but it is simply intended to be a guideline for potential minor professors to use in advising students.

1. Algebra emphasis: 4200 or 4023, 4153, 7200, 7210, or 7400
2. Discrete Math emphasis: 4171, 4172, 7200, or 7400 or alternately: 4200 or 4023, 4470, 7200, 7400
3. Traditional Applied Math emphasis: 4031, 7320, another 7000-level class, and one of 4032, 4036, 4055 , 4065, 4340, 4345.