

Graduate Programs in Mathematics, Statistics, and Physics

The Department of Mathematics, Statistics, and Physics at Wichita State University offers courses leading to the Master of Science (MS) degree in Mathematics and the Doctor of Philosophy (PhD) degree in Applied Mathematics. The MS program provides the mathematical background needed for many professions in business, industry and teaching. The objective of the PhD program is to prepare the student for a career as a research mathematician in either an industrial or academic setting.

A significant feature of graduate study at Wichita State University is the emphasis placed on applied mathematics within the department. More than half of the department's graduate faculty is engaged in research in applied areas of mathematics. The faculty maintains close contact with local businesses and industries, as well as with the University's College of Engineering, regarding their interests in applied mathematical research.

Doctor of Philosophy in Applied Mathematics

The primary emphases in the doctoral program in applied mathematics are partial differential equations, probability and statistics, and computational mathematics.

Admission Requirements

Admission to the PhD program in Applied Mathematics requires completion of an undergraduate degree in Mathematics and/or Statistics, or the equivalent, including coursework in advanced calculus, linear algebra, modern algebra and numerical methods. A grade point average of 3.25 in coursework in mathematics and statistics is required, as well as a GPA of 3.00 in the last 60 hours (3.25 if the student has a previous Master's degree). The GRE subject test in mathematics is recommended but not required.

Degree Requirements

Course Requirements: A total of at least 84 hours of graduate credit is required. Partial Differential Equations for Engineers (MATH 757) and Complex and Vector Analysis for Engineers (MATH 758) and mathematics or statistics courses numbered below 700 may not be included.

At least 36 hours must be in mathematics and statistics courses numbered above 800 (exclusive of PhD Dissertation [MATH 985]). Courses used toward a master's degree may be included.

A maximum of 36 hours may be transferred from another university at the discretion of the student's committee. Real Analysis I and II (MATH 743 and 843) and Numerical Linear Algebra (MATH 751) are required of all students. In addition a student must complete one of the following two sets of requirements:

(A) Complex Analysis I and II (MATH 745 and 845), Partial Differential Equations I and II (MATH 755 and 855), Functional Analysis I and II (MATH 941 and 942), and Numerical Analysis of Partial Differential Equations (MATH 852).

(B) Theory of Statistics I and II (STAT 771 and 772), Theory of Probability I and II (STAT 861 and 862), Theory of Statistical Inference I and II (STAT 870 and 871), and Theory of Linear Models I and II (STAT 872 and 873).

Language Requirements: The student must demonstrate proficiency either in two foreign languages or in one foreign language and one high level computer language. The foreign languages are Chinese, French, German, and Russian.

Residency Requirement: The student must complete at least one academic year in residence as a full-time student at WSU.

Qualifying Exam: The qualifying exam is a written exam administered near the middle of both the fall and spring semesters. The exam is a six-hour exam given on two different days within a one week period. The topics covered by the exam are real analysis, numerical analysis, advanced calculus, and linear algebra.

PhD Committee: Upon the student passing the qualifying exam, the graduate coordinator, in consultation with the student, recommends to the department PhD Advisory Committee a PhD committee for the student. The student's PhD committee consists of the student's dissertation advisor as chair and four other members.

Preliminary Exam: The preliminary exam covers specific topics relevant to the student's research area.

Dissertation and Final Exam: Upon passing the preliminary exam, the student becomes a candidate for the PhD degree. Soon thereafter the student must submit a written dissertation proposal to his or her committee for approval. While working on the dissertation the student should enroll for a total of at least 18 hours of PhD Dissertation. After the dissertation is completed, the student must present and defend it before the committee. This defense constitutes the final exam.

Master of Science in Mathematics

Admission Requirements

Student will be admitted to full graduate standing if they have the equivalent of an undergraduate degree in mathematics, have a grade point average of at least 3.000 in mathematics courses, and meet Graduate School admission requirements.

Degree Requirements

To complete the MS degree, students must earn 33 semester hours of graduate credit, with a minimum of 24 semester hours in courses in mathematics or statistics offered by the department (exclusive of thesis) numbered 700 or above. The 33 hours must include the completion of three two-semester sequences in mathematics and /or statistics numbered 700 or above. Students who plan to enter the PhD program in

applied mathematics should include Real Analysis I and II (MATH 743 and 843) and Numerical Linear Algebra (MATH 751) in their MS program of study.

Generally not more than 6 hours of approved course work may be transferred from another university. Students may take either a thesis or a non-thesis option. Students electing to write a thesis should enroll in MATH 885 for up to 6 hours credit. A student's program must be approved by the department. An oral comprehensive examination is required of all degree candidates. For students electing the non-thesis option, the exam covers four courses, numbered 700 or above, chosen by the student. For students electing the thesis option, the comprehensive examination takes place at the same time as the thesis defense. The examination normally concentrates on the thesis, plus possibly two courses, numbered 700 or above, chosen by the student.

A student in the PhD program in Applied Mathematics who does not have a previous Master's degree in Mathematics will be eligible to receive the MS degree in Mathematics upon satisfying the following: a) completion of at least 33 hours in Mathematics courses applicable toward the PhD degree course requirements, and b) passing the PhD Qualifying Exam. In such cases the qualifying exam will constitute the comprehensive exam for the MS degree.

Financial Support

Most full-time graduate students in mathematics receive financial support. Students in both the master's and PhD programs are eligible for graduate teaching assistantships, which carry a full tuition waiver in addition to a stipend. Graduate teaching assistants teach one 5-hour course per semester. Students whose native language is not English are required to attain a score of 50 on the Test of Spoken English (TSE) before teaching at WSU. In addition to teaching assistantships, several fellowships providing additional support are available for students in the PhD Program.

Graduate Faculty

Andrew F. Acker, PhD, Boston University, 1972. Partial differential equations

Elizabeth Behrman, PhD, University of Illinois, 1985. Quantum mechanics

Alexandre Boukhgueim, PhD, Novosibirsk, 1974. Inverse problems

Stephen W. Brady, PhD, Indiana University, 1968. Analysis

Dharam V. Chopra, PhD, University of Nebraska, 1968. Statistics, combinatorial math

Thomas K. DeLillo, PhD, New York University, 1985. Numerical conformal mapping

Alan R. Elcrat, PhD, Indiana University, 1967. Partial differential equations

Jason Ferguson, PhD, University of Kentucky, 1997. Astrophysics

Buma L. Fridman, PhD, Leningrad Pedagogical Institute, USSR, 1973. Several complex variables

Hussein Hamdeh, PhD, Northeastern University, 1986. Condensed matter physics

James Ho, PhD, University of California, Berkeley, 1966. Superconductivity

Lo-p-Hing Ho, PhD, Princeton University, 1984. Several complex variables, partial differential equations

Xiaomi Hu, PhD, University of Missouri-Columbia, 1993. Probability theory, statistics

Victor Isakov, PhD, Institute of Mathematics, USSR, 1973. Partial differential equations

Thalia Jeffres, PhD, State University of New York at Stony Brook, 1996. Differential geometry, partial differential equations

Zhiren Jin, PhD, University of Pennsylvania, 1990. Partial differential equations; geometric analysis

Kirk E. Lancaster, PhD, Oregon State University, 1981. Partial differential equations

Tianshi Lu, PhD, SUNY Strongbrook, 2005. Numerical analysis

Daowei Ma, PhD, Washington University-St. Louis, 1990. Several complex variables; geometric analysis

Holger Meyer, PhD, Virginia Tech, 2002. Experimental particle and nuclear physics

Kenneth G. Miller, PhD, University of Chicago, 1975. Partial differential equations

Hari G. Mukerjee, PhD, State University of New York, Binghamton, 1977. Probability theory, statistics

Phillip E. Parker, PhD, Oregon State University, 1977. Differential geometry, math physics, number theory

Nickolas Solomey, PhD, University of Geneva, 1992. Experimental particle and nuclear physics

Ziqi Sun, PhD, University of California-Los Angeles, 1987. Inverse problems

For More Information

Graduate Coordinator

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