

College of Arts and Sciences

Mathematics

Overview

Our technological world has many fields that require mathematical expertise. The Department of Mathematics at Kansas State University offers courses for those pursuing a career in mathematics and those needing quantitative and problem-solving skills for use in other fields.

Mathematics graduates are sought for their specialized knowledge and for their ability to reason, think analytically and solve problems. Well into the future, there will be a demand for mathematically trained people in technologically related positions dealing with applications and education at all levels.

Professional options

Careers

Career opportunities in mathematics are in four different areas: working in the actuarial or financial services sectors; researching and applying mathematics in business, government or industry; doing research and teaching mathematics at a university; and teaching mathematics in a college or secondary school.

K-State math graduates work as analysts, consultants, programmers or researchers for businesses; as financial, numerical or systems analysts for financial or high-tech companies; as actuaries for insurance and mutual fund companies; as consultants, cryptologists, mathematicians or statisticians for the government; or as mathematical scientists in research labs.

Research and teaching at the university level requires additional training in the applied or theoretical side of mathematics. Researchers at major universities such as K-State create most new mathematics. Mathematics education involves teaching at the secondary

Points of pride

K-State has been a very selective recommended mathematics program for more than 25 years in "Rugg's Recommendations on the Colleges." Twenty-eight K-State math majors have been Goldwater scholars, one has been a Rhodes scholar, one a Fulbright scholar and five have been National Science Foundation Graduate Research fellows.

school, community college, four-year college and university levels. The Department of Mathematics at K-State offers training in the fundamentals leading to positions in each of these career areas. Degrees granted by the department include the Bachelor of Science, or B.S.; Bachelor of Arts, or B.A.; Master of Science, or M.S.; concurrent B.S. and M.S., and Doctor of Philosophy. Students who earn a master's degree may pursue a career as a community college teacher.

Alumni

Our program has granted more than 200 bachelor's degrees during the past 10 years. In recent years, nearly half of our graduates went on to graduate school, one-third went into high-tech jobs, 10 percent went into teaching high school math and 10 percent went into other jobs.

Academics

Degree options

Students may major in mathematics and another discipline within the College of Arts and Sciences. The degree requirements of both departments must be met.

Students may obtain a degree in mathematics and a second degree in a field in another college such as engineering, education or business administration. Dual-degree seeking B.S. students must fulfill all requirements for the College of Arts and Sciences in at least two of the four required areas: humanities, social science, natural science and additional B.S. requirements. Additionally, these students must complete half of the distribution requirements in the remaining two areas.

Our program is very flexible and many of our students are dual majors in mathematics and another field such as biology, chemistry, computer science, economics, education, engineering, English, finance, modern languages, philosophy, physics or statistics, .

Student may obtain both a B.S. and a M. in mathematics in five years by pursuing a concurrent B.S. and M.S. in mathematics. Students wanting to simply expand their knowledge of mathematics may pursue a minor in mathematics. Full descriptions of the minor and the concurrent B.S. and M.S. can be found on the math department's website, math.k-state.edu.

Faculty

The faculty members in the Department of Mathematics at K-State have a long history of mentoring and supporting undergraduate studies and research by undergraduate math majors who go on to internships, research experiences, high-tech jobs and graduate study in a wide variety of fields. Our award-winning faculty come from some of the best universities in the world, and they conduct cutting-edge mathematical research in many different areas.

Activities

Research

The university's I-Center fosters groups of undergraduate and graduate students, postdocs and faculty jointly working on cutting-edge problems in applied mathematics, pure mathematics and interdisciplinary areas. Such experience is pivotal for undergraduates to learn how to do creative research. Students involved in undergraduate research enhance their excellence in national research programs and graduate schools and in a variety of majors.

The Undergraduate Mathematics Seminar introduces students to our department, programs, various applications of mathematics and to the many available career opportunities. The seminar features presentations by alumni, faculty, and business and government representatives.

Suggested coursework

The general requirements for the B.A. and B.S. degrees include a minimum of 120 semester hours and the following courses:

Hrs. Courses

6	Expository Writing I and II
2	Public Speaking IA
2-3	Fine arts (1 course)
3	Philosophy (1 course)
3	Western heritage (1 course)
3	Literary or rhetorical arts (1 course)
12	Social science (4 courses)
4	Life science with lab
4	Physical science with lab
6-8	Additional natural sciences (2 courses)
3	International overlay (1 course)
3	U.S. multicultural overlay (1 course)

In addition, the mathematics department requires the following courses:

12	Analytic Geometry and Calculus I, II and III
4	Elementary Differential Equations
3	Abstract Algebra
3	Analysis
3	Linear Algebra
12	Additional upper-division mathematics (four courses)
3-4	Computer Programming
3	Probability and Statistics

Students should enroll in MATH 199 Undergraduate Mathematics Seminar in their first fall on campus.

Applied mathematics

Students who intend to apply mathematics in business, government or industry should take the following courses:

Hrs. Courses

3	CIS 209	Programming for Engineers
3	MATH 510	Discrete Mathematics
3	MATH 512	Introduction to Modern Algebra
3	MATH 540	Ordinary Differential Equations
3	MATH 551	Applied Matrix Theory
3	MATH 632	Elementary Partial Differential Equations
3	MATH 633	Advanced Calculus I
3	MATH 655	Elementary Numerical Analysis
3	STAT 510	Introductory Probability and Statistics I

Students should also take as many additional computer science and statistics courses as possible.

Actuarial mathematics

Students who intend to work in the actuarial or financial services sectors should take the following courses:

Hrs. Courses

3	CIS 111	Introduction to Computer Programming
3	MATH 500	Mathematical Theory of Interest
3	MATH 501	Mathematical Foundations of Actuarial Science
3	MATH 510	Discrete Mathematics
3	MATH 512	Introduction to Modern Algebra
3	MATH 551	Applied Matrix Theory
3	MATH 633	Advanced Calculus I
3	MATH 655	Elementary Numerical Analysis
3	STAT 510	Introductory Probability and Statistics I

For Verification of Educational Experience, or VEE, students should take the following courses:

3	ECON 110	Principles of Macroeconomics
3	ECON 120	Principles of Microeconomics
3	FINAN 450	Principles of Finance
3	MATH 599	Introduction to Time Series Analysis
3	STAT 511	Introductory Probability and Statistics II

Mathematics pregraduate

Students who intend to enter graduate school to work toward an advanced degree in either pure or applied mathematics — or a related field — should take the following courses:

Hrs. Courses

3	CIS 111	Introduction to Computer Programming
3	MATH 506	Introduction to Number Theory
3	MATH 512	Introduction to Modern Algebra
3	MATH 515	Introduction to Linear Algebra
3	MATH 560	Introduction to Topology
3	MATH 630	Introduction to Complex Analysis
3	MATH 633	Advanced Calculus I
3	MATH 634	Advanced Calculus II
3	STAT 510	Introductory Probability and Statistics I

Students also should take additional courses in related fields such as computer science and statistics.

Mathematics teacher preparation

Students who intend to become secondary school mathematics teachers may prepare for teacher licensure by completing the requirements for a secondary education mathematics teacher license in the College of Education. The following courses are recommended for such students:

Hrs. Courses

3	CIS 111	Introduction to Computer Programming
3	MATH 312	Finite Applications of Mathematics
3	MATH 506	Introduction to Number Theory
3	MATH 510	Discrete Mathematics
3	MATH 511	Introduction to Algebraic Systems
3	MATH 520	Foundations of Analysis
3	MATH 551	Applied Matrix Theory
3	MATH 570	History of Mathematics
3	MATH 572	Foundations of Geometry
3	MATH 591	Topics in Mathematics for Teachers
3	STAT 510	Introductory Probability and Statistics I

For more information about mathematics, contact:

Undergraduate Programs
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138 Cardwell Hall
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785-532-0557
ugmath@math.k-state.edu
math.k-state.edu

For more information about Kansas State University, contact:

Office of Admissions
Kansas State University
119 Anderson Hall
919 Mid-Campus Drive North
Manhattan, KS 66506-0102
1-800-432-8270 (toll free) or
785-532-6250
k-state@k-state.edu
k-state.edu/admissions

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Notice of nondiscrimination
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Post-Graduation Statistics
k-state.edu/postgrad-stats
ksdegreestats.org