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 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.

Research experience
Many of our students win paid undergraduate research opportunities at scientific institutions and in industry.

Success experience
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 and to the many available career opportunities.

Job experience
Many internships and co-op opportunities are available to students in mathematics to gain experience and contacts in their field of interest before graduation. A wide variety of employer’s recruit students through the All-University Career Fair and employer-sponsored recruitment events. Many companies actively recruit and employ mathematics students for both internships and full-time jobs. A number of on-campus mathematics paper grading and tutoring positions are available for students to keep experience current and to build a firmer foundation in mathematics.
Preparation
Problem-solving is an important skill in all STEM related fields, so you should pursue any courses that develop this skill. In particular, you should take at least two years of high school algebra, one semester of trigonometry and a course in calculus. It also is important to develop sound communication skills while in high school by taking rigorous composition classes. If your school has a computer science program, you should study problem-solving, programming methodology and a high-level programming language. Study skills are tremendously important to succeeding in college. We suggest students achieve good study skills while in high school by complementing a rigorous course of study with study skills training either on-line or in a classroom.

Help with success
The department offers over 25 hours of free help in mathematics ranging from college algebra to 600 level advanced calculus. We strongly recommend utilizing all available free help in a variety of subjects to sharpen your study skills, develop study partnerships, and bring your overall GPA up one or more letter grade(s) as the public university GPA cut-off for graduate school is 3.0.

Clubs / Professional Organizations
Students in mathematics are encouraged to join mathematical societies and clubs for contact with industry professionals and peer mentoring:

Math Club Pi Mu Epsilon
www.math.ksu.edu/events/student-activities/

Professional Organizations
www.math.ksu.edu/ugrad/research/external_math_resources.html

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
3 MATH 500 Programming 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 550 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 student:

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

Graduate Certificate
The department offers a graduate certificate in applied mathematics:

www.math.ksu.edu/graduate/degrees/cert-appl-math-prog.html

BS/MS Concurrent Degrees
The department offers a BS/MS concurrent program in mathematics:

www.math.ksu.edu/graduate/degrees/concurrent-prog.html

Many Dual Major Options are Available
www.math.ksu.edu/ugrad/dualmajors/

Minor in mathematics
The department offers a minor in mathematics. The minor is 24 credit hours and includes the core math courses required for a Mathematics major along with selected electives.

For more information about mathematics, contact:
Undergraduate Programs
Department of Mathematics
Kansas State University
138 Cardwell Hall
1228 N. 17th St. Manhattan, KS 66506-2602
785-532-0557
ugmath@math.k-state.edu
www.math.k-state.edu

For more information about Kansas State University, contact:

Office of Admissions Kansas State University
119 Anderson Hall
910 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

Professional Organizations
www.math.ksu.edu/ugrad/research/external_math_resources.html

Notice of nondiscrimination
Kansas State University prohibits discrimination on the basis of race, color, ethnicity, national origin, sex (including sexual harassment and sexual violence), sexual orientation, gender identity, religion, age, ancestry, disability, genetic information, military status, or veteran status, in the University’s programs and activities as required by applicable laws and regulations. The person designated with responsibility for coordination of compliance efforts and receipt of inquiries concerning nondiscrimination policies is the University’s Title IX Coordinator: the Director of the Office of Institutional Equity, equity@k-state.edu, 133 Edwards Hall, Kansas State University, Manhattan, Kansas 66506, (785) 532-6220. The campus ADA Coordinator is the Director of Employee Relations, chrism@k-state.edu, who may be reached at 103 Edwards Hall, Kansas State University, Manhattan, Kansas 66506, (785) 532-6277

Post-Graduation Statistics
k-state.edu/postgrad-statsdegreestats.org