MATHEMATICS

Mathematics, one of the oldest and most basic disciplines, continues to address and propose solutions to critical contemporary matters. It was a mathematician who invented the carburetion system of the Volvo; a mathematician who created the fuel efficient wing on the Boeing 767; a mathematician who used prime numbers to create the new generation of “unbreakable” codes; and mathematicians who devised the use of the fast Fourier transform in the resolution of photographs from space vehicles, and the use of satellites for communication.

There are two broad categories of mathematics: (1) pure, or theoretical, mathematics and (2) applied, or practical, mathematics. Pure mathematicians usually obtain the PhD degree. They search for new principles and/or new relationships between existing principles in an effort to increase the basic knowledge of mathematics, regardless of what the applications might be.

Applied mathematicians develop theories and techniques that solve problems. Examples include a bridge, airplane or building design in an engineering project; the effectiveness of a new drug in scientific research; increasing the profits or the efficiency of the production line in industry; or finding ways to use existing information in research and development.

Statisticians use mathematical theories to collect and analyze numerical information and to estimate unknown quantities. They plan and design surveys, such as those used in Nielsen ratings, Dow-Jones averages and Gallup polls.

A strong mathematics background is required for insurance company actuaries who design financially sound insurance and pension plans. They collect and analyze statistics to calculate the chance of death, injury, and so forth, and compute the premiums necessary to pay the claims.

As a math major, you will study calculus, differential equations, numerical analysis, probability and statistics and other mathematical areas. Then you will be prepared for a variety of careers.

All mathematics careers require good communication skills – including an ability to write well – since it is necessary to explain findings to non-mathematicians. Faculty advisors will help you select courses that will give you a well-rounded education that fits your interests and career goals.

Admission
When you choose to study mathematics, you will be admitted to the Fairmount College of Liberal Arts and Sciences. You will be assigned a faculty advisor in the math department who will help you develop your program of study and who will outline specific requirements.

If you are still deciding on a major when you begin taking classes at WSU, the LAS Advising Center will help you explore career and major options.

Related Opportunities
If you are a math major, you will be encouraged to maintain a high GPA so you can join Pi Mu Epsilon, the mathematics honorary.

If eligible, you may be selected for university academic honor societies such as Phi Kappa Phi and Mortar Board.

Related Programs
As a math major, you may pursue a bachelor of science, a bachelor of arts, a BS with honors option, a BS with emphasis in statistics, or a BS with an emphasis in computer science. You might want to teach mathematics, or get a BA with additional courses in education. Other programs that might appeal to you include computer science and engineering.

General Education Program Requirements
What is the overall goal?
The goal of general education is to enable you to live a rich, meaningful life by developing: an informed appreciation of the arts, humanities, and natural and social sciences; an ability to intelligently follow and participate in current events; and a sensitive and tutored appreciation of diverse cultures and ways of living.

What are the expected outcomes?
Embedded throughout general education and furthered in the major are the skills that enable graduates to contribute productively to society and the on-going culture. Therefore, upon graduation the faculty expects you to:

- Have acquired knowledge in the arts, humanities, and natural and social sciences
- Think critically and independently
- Write and speak effectively
- Employ analytical reasoning and problem solving techniques
Major Requirements

Requirements for the BA or BS in mathematics or a BS in mathematics with an emphasis in statistics
- Calculus I-III
- An Introduction to Advanced Mathematics
- Linear Algebra
- Ordinary Differential Equations
- Numerical Methods
- Advanced Calculus I
- High-level algorithmic computer language

Additional requirements for the BA degree
- Introduction to the History of Mathematics
- Two additional courses from those in Groups A, B and C

Additional requirements for the BS degree
- One course from Group A
- One course from Group B
- One course from Group C
- Two additional courses from Group B and/or Group C

Additional requirements for the BS degree with an emphasis in statistics
- Two courses from Group B
- One course from Group C
- Statistical Methods I and II
  OR
  Theory of Statistics I and II
- One additional course from Group B and/or Group C

Group A
- Fundamental Concepts of Algebra
- Elementary Number Theory
- Elementary Geometry
- Introduction to Mathematical Logic
- Modern Geometry
- Elementary Topology I

Group B
- Elementary Probability and Mathematical Statistics
- Statistical Methods I and II
- Elementary Survey Sampling
- Applied Nonparametric Statistical Methods
- Applied Regression Analysis
- Theory of Statistics I and II
- Applied Statistical Methods I and II

Group C
- Applied Combinatorics
- Integration Techniques and Applications
- Mathematical Models
- Introduction to Complex Variables
- Advanced Calculus II
- Differential Equations II
- Optimization Theory
- Applied Mathematics
- Numerical Analysis
- Ordinary Differential Equations
- Partial Differential Equations

For more information
If you have further questions or would like to schedule a campus visit, please contact the Office of Admissions.

Marcus Welcome Center  wichita.edu/admissions
Office of Admissions  wichita.edu/visit
1845 Fairmount
Wichita, KS 67260-0124

KSDegreeStats.org

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For more information on Mathematics at WSU visit wichita.edu/math or call (316) 978-3160.