

# 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 at Wichita State University, 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 advisers 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 adviser 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 Omicron Delta Kappa, 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**

The General Education Program is an integral component of every degree at Wichita State University. These courses make up about one third of any degree. The goals of the General Education program are:

- **To study and apply mathematical principles;**
- **To study and apply principles of written and oral communication;**
- **To study and apply basic library research skills including basic assessment of various kinds of sources;**
- **To study the natural sciences, social and behavioral sciences, humanities and fine arts in order to understand how scholars in those fields work;**
- **To study human diversity and its implications for society on a global basis.**

Successful completion of the General Education Program and LAS College requirements provides knowledge and skills leading to life-long learning in an ever-changing global world.

Descriptions of the General Education Program and of the courses that are included in it are available both in the *University Catalog* and in the *Schedule of Courses*. These documents are available both in hard copy form and online at the WSU Web site: [www.wichita.edu](http://www.wichita.edu). Click on "Browse A-Z" and use C for the *Catalog* and S for the *Schedule of Courses* menu option, and then select "General Education."

When you enter the university, you will work with an academic advisor to select general education courses for your major and your degree choice.

### **For More Information**

To receive more information, or to schedule a campus visit, contact:

Office of Admissions  
Wichita State University  
1845 Fairmount St.  
Wichita, Kansas 67260-0124  
Phone (316) 978-3085  
Toll-free (800) 362-2594  
[www.wichita.edu/admissions](http://www.wichita.edu/admissions)

The University reserves the right to revise or change rules, charges, fees, schedules, courses, requirements for degrees, and any other regulations affecting students whenever considered necessary or desirable.

### Notice of Nondiscrimination:

Wichita State University does not discriminate on the basis of race, religion, color, national origin, gender, age, marital status, sexual orientation, status as a Vietnam-era veteran, or disability. Any person having inquiries concerning this may contact the Office of Equal Employment Opportunity Wichita State University, 1845 Fairmount St., Wichita, Kansas 67260-0145; telephone (316) 978-3001.

## **Major Requirements**

### **Requirements for the BA or BS in mathematics or a BS in mathematics with 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 (see below)

### **Additional requirements for the BS degree with 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, Topology; I

**Group B:** Elementary Probability and Mathematical Statistics, Statistical Methods I and II, Elementary Survey Sampling, Applied Nonparametric Statistical Models, Probability, Applied Stochastic Processes, Applied Regression Analysis, Analysis of Variance, Theory of Statistics I and II, Applied Statistical Methods I and II;

**Group C:** Applied Combinatorics, Integration Techniques and Applications, Mathematical Models, Advanced Calculus II, Differential Equations II, Optimization Theory, Applied Mathematics, Numerical Analysis, Ordinary Differential Equations, Partial Differential Equations.