

# MATHEMATICS



XAVIER  
UNIVERSITY

**MATHEMATICS IS THE STUDY** of pattern and quantity in various subject areas, including modern algebra, real and complex analysis, statistics and topology. Students learn critical thinking, logical reasoning and the precise expression of ideas, preparing them to take on demanding mathematical tasks in a field growing with the advancement of technology to include business and industry, along with teaching and graduate education.

## Bachelor of Science (BS) in Mathematics

**Minors:** Mathematics, statistics

### The Xavier Advantage:

- ▶ Work as tutors in the Mathematics Tutoring Lab and Learning Assistance Center.
- ▶ Participate in internships and special summer study programs nationally and in the Cincinnati area, including the National Science Foundation's Research Experiences for Undergraduates program and Xavier's summer research program.
- ▶ Get involved in the American Mathematical Society.
- ▶ Join the Xavier student chapter of the Mathematical Association of America, and be invited to join the national honorary mathematics society, Pi Mu Epsilon.

### Xavier mathematics graduates go on to:

- ▶ Ohio Casualty Insurance
- ▶ E-Technologies Group
- ▶ Fidelity Investments
- ▶ Mercy Health Partners
- ▶ General Electric
- ▶ Western & Southern
- ▶ The Nielson Company
- ▶ Northwestern University
- ▶ University of Notre Dame
- ▶ Emory University
- ▶ Vanderbilt University

**Learn more** [www.xavier.edu/mathematics](http://www.xavier.edu/mathematics)

**Ask us** [xuadmit@xavier.edu](mailto:xuadmit@xavier.edu)

**Visit campus** [www.xavier.edu/visit](http://www.xavier.edu/visit)



## RECOMMENDED CLASS SCHEDULES

### BACHELOR OF SCIENCE [BS] IN MATHEMATICS

These schedules serve as a guideline for progress toward a degree. Students should consult with their academic advisor.

First Semester	Sem. Hrs.
<b>FRESHMAN YEAR</b>	
MATH 170, Calculus I	4
CSCI 170, Computer Science I	3
Foreign Language elective	3
ENGL 101 <b>OR</b> 115, Engl Comp/Rhetoric	3
Total	13

Second Semester	Sem. Hrs.
<b>FRESHMAN YEAR</b>	
MATH 171, Calculus II	4
MATH 225, Foundations of Higher Math	3
Foreign Language elective	3
PHIL 100, Ethics as Intro to Phil	3
THEO 111, Theological Foundations	3
Total	16

SOPHOMORE YEAR	
MATH 220, Calculus III	4
MATH elective	3
History I elective	3
Literature elective	3
PHIL 290, Theory of Knowledge	3
Total	16

SOPHOMORE YEAR	
MATH 240, Linear Algebra	3
MATH elective	3
History II elective	3
ENGL/CLAS/SPAN/FREN 205 Lit & Moral Imag	3
Theo Scrip/Hist <b>OR</b> Christ Sys elective	3
Total	15

JUNIOR YEAR	
MATH 340, Abstract Algebra I	3
MATH elective	3
Philosophy elective	3
Science elective	4
Fine Arts elective	3
Total	16

JUNIOR YEAR	
MATH 370, Intro to Real Analysis	3
MATH elective	3
MATH 391, Mathematics Seminar 1	1
Science elective	4
Theology Ethics <b>OR</b> Rel/Cult elective	3
Total	14

SENIOR YEAR	
MATH elective	3
MATH 392, Mathematics Seminar 2	1
Science elective	3
Social Science elective	3
General electives	6
Total	16

SENIOR YEAR	
MATH 393, Mathematics Seminar 3	1
Social Science elective	3
General electives	6
E/RS Focus elective	3
Total	13

- Scheduling notes:**
- Consult the undergraduate Core Curriculum requirements.
  - The E/RS Focus elective requirement may be used to satisfy another element of the Core or the major.
  - A minimum of 120 credit hours is required for the degree.
  - Students are required to take 6 hours of approved courses representing two different disciplines to fulfill the Core Diversity requirement.

► For additional degree class schedules in mathematics and computer science, visit [www.xavier.edu/mathematics](http://www.xavier.edu/mathematics).

## THE PROGRAM

The Department of Mathematics and Computer Science is housed in Hinkle Hall, the campus facility that's modeled after the Xavier family castle in Navarre, Spain.

Faculty members have earned doctoral degrees from distinguished institutions around the nation. They have served as principal investigators on National Science Foundation grants, and received awards and fellowships to create new courses and related academic initiatives.

With introductory classes of typically 25 students and smaller upper-level classes, personalized attention and faculty expertise are readily available. Each student receives individual counseling from members of the department. The faculty believes that the best teaching can be done only when there is close faculty-student interaction for discussion, thinking and exploring.

The program prepares students for the growing variety of mathematics careers by emphasizing key skills:

- ▶ Developing an understanding of the contemporary and historical role of mathematics and being able to place the discipline properly in the context of other human intellectual achievement.
- ▶ Learning to use appropriate technology in all aspects of problem solving.
- ▶ Cultivating interests in applied areas such as operations research, probability, computer science, numerical analysis, financial mathematics and mathematical economics.
- ▶ Gaining the ability to read and learn mathematics on your own.
- ▶ Fostering creativity and the use of the imagination, particularly in the understanding and development of proofs.
- ▶ Preparing for graduate studies in mathematics or related disciplines, for teaching at the secondary level, or for careers requiring mathematical training.

## RESOURCES

Mathematics and computer science courses meet in technology-based classrooms when needed. *Maple*, a computer algebra system used in many mathematics courses, is available in the technology-based classrooms and in the general-access Xavier computer labs. The department maintains a Mathematics Tutoring Lab in the Conaton Learning Commons, offering free help to all Xavier students in math classes 105 through 171 (except Math 125), with no appointment necessary. Individualized, private tutoring is available through the Learning Assistance Center.

Students have opportunities for internships and special summer study programs both nationally and in the Cincinnati area, including the National Science Foundation Research Experiences for Undergraduates program and opportunities available through the American Mathematical Society. Students also have the opportunity to experience research with a Xavier faculty member.

On-campus work as tutors also is available in the Mathematics Tutoring Lab and the Learning Assistance Center. Students may also serve as graders for Core Curriculum mathematics courses.

The Xavier student chapter of the Mathematical Association of America, offering career information, funding opportunities and professional development, is open to all math majors, who also may receive an invitation to join the national mathematics honor society, Pi Mu Epsilon.

## OUTCOMES

Employment of mathematicians is expected to increase by 22 percent through 2018, much faster than the average for all occupations according to the U.S. Bureau of Labor Statistics. Advancements in technology usually lead to expanding applications of mathematics, and more workers with knowledge of mathematics will be required in the future.

Through the study of mathematics, students develop problem-solving and critical-thinking skills, opening the way to career opportunities in all areas of business and industry. Mathematicians are in demand to fill both traditional and emerging positions in engineering, computer science, the physical sciences and statistics. Math majors also enter the fields of business, education, law, economics, and other social and health sciences.

Xavier's math graduates have gone on to such positions and employers as the following:

- Actuary, Ohio Casualty Insurance
- Attorney, Taft, Stettinius & Hollister
- Automation engineer, E-Technologies Group
- Consultant, Fidelity Investments
- Data architect, Commonwealth of Massachusetts
- Executive director of international business, SBC Communications
- Financial analyst, Western Southern Fund
- Human resources director, Mercy Health Partners
- Information solutions manager, General Electric
- Market analyst and planner, Cinergy Corp.
- Materials manager, Beaver Aerospace & Defense
- Math teacher, Sycamore High School
- Math teacher, Chicago Public Schools
- Operations research analyst, U.S. Army
- Professor, California Polytechnic State University
- Professor, University of Illinois, Urbana-Champaign
- Senior analyst, Gap Stores
- Senior vice president, Fifth Third Bancorp
- Systems engineer, IBM Corp.

Graduates also have been accepted into and received fellowships for graduate programs at such prestigious institutions as:

- Emory University
- Indiana University
- Miami University (Ohio)
- Michigan State
- North Carolina State University
- Northwestern University
- Rice University
- University of Cincinnati
- University of Florida
- University of Kentucky
- University of Nebraska
- University of Notre Dame
- University of Colorado-Boulder
- University of Wisconsin-Madison
- Vanderbilt University

The Conaton Learning Commons, opened in 2010, is the heart of the James E. Hoff, S.J., Academic Quad. The Commons provides students with the facilities, technologies and services to help them master essential skills and gain a competitive advantage in their respective disciplines and careers. As a result, Xavier graduates are better prepared to enjoy successful lives and careers.

The Commons:

- ▶ Features 84,000 square feet, five floors and 24/7 environment.
- ▶ Creates a focal point for connecting teaching, learning and the Jesuit mission of service to others.
- ▶ Equips students with academic and technological tools in a wireless setting.
- ▶ Offers ample space for individual study and group work in a wireless setting with access to plasma screens, movable white boards and a café.
- ▶ Houses centers for academic advising and career services and labs for math, writing and modern languages.
- ▶ Includes a digital media lab, classrooms, auditorium and a centralized location for reference and technology assistance.

## THE COLLEGE & THE CITY

The College of Arts and Sciences is the oldest and largest college at Xavier University. Its goal is to provide excellent liberal arts education in the Jesuit tradition that prepares students for careers, professional or graduate school, and life in a global society.

Centrally located in the heart of the Midwest and set along the Ohio River, Cincinnati is a thriving city, offering college students in the region a wide range of opportunities for internships and careers. Culture and entertainment ranges from the Cincinnati Art Museum to the Cincinnati Reds. Affordable and accessible, Cincinnati is rated one of the "most wired" U.S. cities (*Forbes Magazine*), most sociable city in the world (mashable.com), and one of the top 15 U.S. cities to live and work (*Fortune Magazine*).

## CORE CURRICULUM

The foundation of Xavier's success is its commitment to its Jesuit heritage. The Core Curriculum embodies Xavier's mission and philosophy of education and serves as a valuable foundation for all undergraduate students. Within the Core, the four-course Ethics/Religion and Society (E/RS) Focus fosters students' understanding of socially significant issues through study of the humanities, especially literature, philosophy and theology, as well as the social and natural sciences. Along with courses in their major, Xavier students also take Core courses in cultural diversity, English composition, fine arts, foreign language, history, literature, mathematics, philosophy, science, social science and theology.

## ACADEMIC REQUIREMENTS

**Core Curriculum:** Minimum 64 credit hours

**Major in mathematics:** 45 credit hours, including three hours of computer science. Students are required to complete the Major Fields Test in mathematics and a senior project that will be presented to department faculty.



## XAVIER AT A GLANCE

Founded in 1831, Xavier University is a Jesuit Catholic university in Cincinnati, Ohio, annually ranked among the nation's best universities. Its three colleges offer 85 undergraduate majors, 54 minors and 11 graduate programs to 7,019 total students, including 4,368 undergraduates.

## FOR MORE INFORMATION

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