COLLEGE OF
Saint Benedict Saint John's
UNIVERSITY

Mathematics

The Discipline

The study of mathematics involves more than equations and theorems; it involves probing problems, explaining premises, drawing conclusions and exploring implications of many problems in areas as diverse as biology, linguistics and economics. Therefore, the department encourages its students to pursue diverse interests both within the mathematics curriculum and outside of it. Whether you hope to teach high school mathematics, pursue graduate work, or establish a career in business, you will find courses that will interest you and prepare you for a successful future.

Program Overview

The College of Saint Benedict and Saint John's University mathematics department offers courses to suit the needs of a variety of students, whether they are majoring in mathematics or a related field, or simply taking courses as a general liberal arts student.

- Provides a sound, flexible theoretical base that prepares students for further study in graduate school, for a career in secondary education or as a mathematician or statistician in business or industry.
- We regard mathematics as an essential part of a liberal arts education and each student must take at least one mathematics course to satisfy the Common Curriculum requirement.
- Our faculty strives to meet each student at the level of his or her interest and ability; in both lower- and upper-division classes, students are encouraged to see mathematics as a conceptual discipline which has been and continues to be an integral part of the broader intellectual culture.

Department Highlights

- Mathematics students regularly present their work at the Mathematical Association of America Student Paper Session held annually at Mathfest. Several have won awards for their work.
- Each year the department sponsors a Pi Mu Epsilon conference, a forum for undergraduates to present their own research or expository papers.
- Each summer, several students engage in summer research projects in mathematics, both here and in Research Experiences for Undergraduates programs elsewhere. The department also participated in a summer undergraduate research exchange program with Southwest China University in Bei Bei, People's Republic of China.
- One of the vehicles for informal discussion is the student-run Mathematics Society, whose regular meetings may include invited speakers, but range from viewing of mathematics films to the biennial donut coloring contest!

Flexible Curriculum

Our courses are structured so that students are actively involved in doing mathematics and demonstrating their understanding of concepts appropriate to that course in various ways. Moreover, we intend that our courses will enable students to understand and use mathematical language and notation and to appreciate the need for that language and notation. They also address the power and limitations of mathematical reasoning as a tool for solving problems from other disciplines and from everyday life.

The mathematics department at CSB and SJU offers a rich variety of courses. If you plan to major in mathematics, you and your adviser will outline a program of study during your sophomore year. This process enables a student to organize his or her coursework, supporting courses and extra-curricular activities in order to meet the student's interests and goals.

Course offerings for majors include:

- History of Mathematics
- Calculus I and II
- Linear Algebra
- Foundations of Mathematical Structures
- Geometry
- Numerical Analysis
- Multivariable Calculus
- Operations Research
- Combinatorics and Graph Theory
- Applied Statistical Models
- Algebraic Structures I and II
- Differential Equations
- Topics in Advanced Mathematics (recently offered topics include game theory, bioinformatics and mathematical modeling)
- Complex Analysis
- Fourier Series and Boundary Value Problems
- Real Analysis
- Mathematical Statistics I and II
- Honors Senior Essay, Research or Creative Project

Study Abroad

The mathematics major can accommodate any study abroad program and we encourage our students to take advantage of that opportunity. In particular, several students have participated in the Budapest Semester in Mathematics Program.

Internships and Research Opportunities

From teaching assistantships to research projects, mathematics students have ample opportunities to develop their interests and skills in a variety of ways. Often the idea for a project will grow naturally out of a topic covered in a course.

A student's research interest may be pursued in the context of another course or in an independent learning project. Summer research fellowships are also available at CSB/SJU or from external sources, such as the National Science Foundation-funded Research Experiences for Undergraduates (REU). Students involved in research projects are encouraged to present their work to their peers at the Pi Mu Epsilon conference which is hosted each spring by CSB and SJU.

A number of students in the mathematics department are selected each year to be course assistants (TAs) who assist professors by grading papers and leading informal tutorial sessions.

In addition to Math Society or Pi Mu Epsilon, students also form groups to practice for the regionally administered problem solving competition, the national mathematical modeling contest, and actuarial examinations.

Outcomes

The mathematics major provides students with excellent preparation for almost any career in business, industry or teaching. Whether you plan to pursue higher education or to launch a career, most employers recognize that math majors have superior analytical and technical skills, are disciplined thinkers and extraordinarily effective problem solvers. Recent career choices by CSB/SJU mathematics students include:

- medical research statistics
- sales/marketing
- actuarial science
- the foreign service (diplomatic corps)
- accounting
- high school teaching
- computer science
- college teaching
- statistical work in business, industry and government
- graduate work in mathematics, statistics, engineering, medicine, law , economics and biomathematics

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Recent graduates' successes

Shaun McElhatton, attorney with Leonard, Street and Deinard, Minneapolis, Minn. "I enjoy a very satisfying practice in the area of real estate development, especially the development of low-income housing. The mathematics education I received at CSB and SJU helps me to evaluate construction budgets and loan terms for clients. More importantly, that background helps me to craft sound logical arguments on behalf of clients and to recognize the logical weaknesses in the arguments of others. I was surprised to discover the high proportion of my classmates at Harvard Law School who had been mathematics majors or had strong mathematics backgrounds as undergraduates. I use the basic reasoning skills I developed as a math major every day in my practice."

Mary Nell Rounds, software technical writer for General Electric Government Services and algebra teacher at Barstow College, Calif. "Throughout my years of math studies, the one skill that was taught in every math course, and which I use each day, is the ability to think analytically. I truly believe this skill is invaluable. I am thoroughly enjoying the opportunity to teach and pass on my knowledge to others. This leads me to a comment on the CSB/SJU math faculty. Whenever I had questions about the material, the faculty was always accessible because they were truly concerned about the progress of their students. Their patience, concern and enthusiasm assisted in my decision to become a math major."

Faculty

Bret Benesh, Department Chair
Ph. D. University of Wisconsin-Madison
(finite group theory; game theory)

Philip Byrne
Ph.D., Pennsylvania State University
(statistics)

Robert Campbell
Ph.D. University of California-Irvine
(algebraic geometry)

Sunil Chetty
Ph.D., University of California-Irvine
(number theory)

Jennifer Galovich
Ph.D., University of Minnesota
(combinatorics; bioinformatics)

David Hartz
Ph.D., Duke University
(mathematical logic)

Robert Hesse
Ph. D. University of Minnesota
(dynamical systems and mathematical modeling)

Kris Nairn
Ph.D., Columbia University
(computational algebraic geometry)

Brian Nyholm
M.S. University of Wisconsin-Superior
(Director of the Math Skills Center)

Travis Peters
Ph.D., Iowa State
(linear algebra)

Thomas Sibley
Ph.D., Boston University
(groups and designs; geometry)

Anne Sinko
Ph.D., University of Alabama at Huntsville
(graph theory)

Michael Tangredi
Ph.D., University of Wisconsin-Madison
(analysis; operations research)

As one member of the department remarked, "We want to work with students — that's why we're here." The mathematics faculty is strongly committed to both teaching and research. Conducting research, attending professional meetings and giving papers keeps them current in their own areas of special interest. From pure to applied, our faculty has professional interests that stretch across the mathematics curriculum; thus, we can support a wide variety of student undergraduate research and introduce all our students to interesting problems from many very different areas of mathematics.