

# MATHEMATICS

UNIVERSITY OF ST. THOMAS, COLLEGE OF ARTS AND SCIENCES



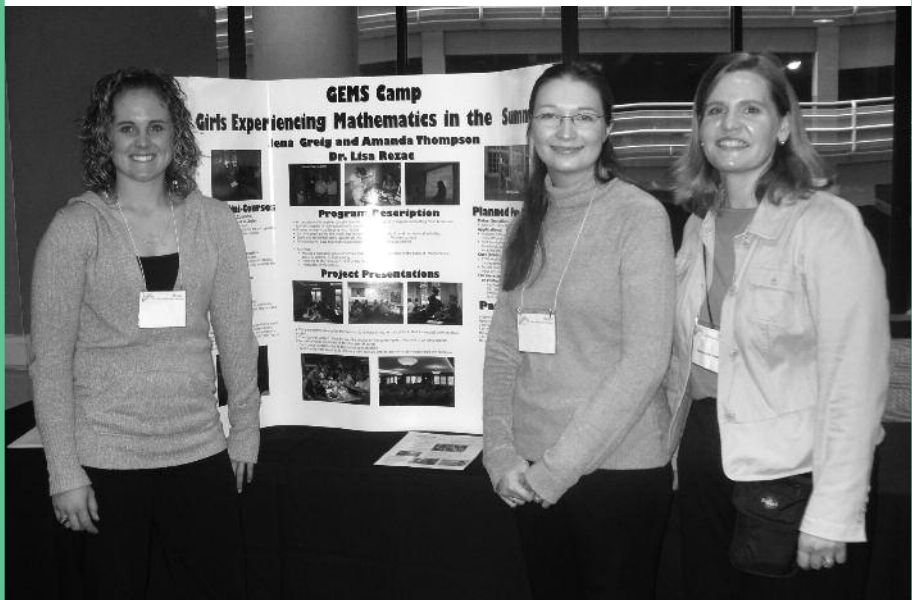
## Why major in mathematics?

Mathematics can be used to help solve real-world problems, such as controlling a disease or analyzing a risk. A math major can satisfy a variety of student interests and careers, preparing graduates to make contributions in many fields. Math alumni may head immediately into the work force, working to support engineering and financial companies or using statistics in fields where testing and reliability are important. Teaching is another career option, K-12 or college. Others further their studies in professional schools, such as law, business and medicine, or graduate programs related to mathematics, including engineering, economics and biostatistics. The habits of rigorous thinking developed by St. Thomas' math curriculum and the focus on applied problems are a good preparation for many careers.

## Options within the Department of Mathematics

The Department of Mathematics offers four programs leading to a major in mathematics, as well as a minor. All math majors must complete the following courses:

- MATH 113 and MATH 114 (Calculus I and II)
- MATH 200 (Multi-Variable Calculus)
- MATH 210 (Introduction to Differential Equations and Systems)
- MATH 240 (Linear Algebra)
- MATH 301 (Abstract Algebra I)
- MATH 317 (Real Analysis)



In addition to the mandatory courses, students must complete CISC 130 (Introduction to Programming and Problem Solving in the Sciences) and the courses required by their chosen major program.

### **Pure Mathematics program**

Students in this program take MATH 302 (Abstract Algebra II), MATH 419 (Complex Variables), MATH 420 (Topology), plus four credits of mathematics in courses numbered 300 or higher.

### **Applied Mathematics program**

Students in this program take MATH 315 and 316 (Applied Mathematics and Modeling I and II), plus 8 credits from the following:

- MATH 300 (Advanced Differential Equations)
- MATH 303 (Statistics for the Applied Sciences)
- MATH 314 (Mathematical Statistics; requires MATH 313 )
- MATH 385 (Mathematical Methods of Numerical Analysis)
- MATH 400 (Dynamical Systems and Chaos)
- MATH 419 (Complex Variables)

### **Statistics program**

Students in this program take MATH 313 (Probability), MATH 314 (Mathematical Statistics), MATH 333 (Applied Statistical Methods: Regression, Time Series, Forecasting), MATH 385 (Mathematical Methods of Numerical Analysis) and IDTH 320 (Statistics II).

### **Mathematics Education program**

Students in this program take MATH 325 (Geometry), MATH 450 (Advanced Mathematics: Exploration & Exposition) and either MATH 303 (Statistics for the Applied Sciences) plus one additional course numbered 300 or above, or MATH 313 (Probability) and MATH 314 (Mathematical Statistics).

For those who are considering teaching mathematics and science in the elementary grades, there is a Science and Mathematics for Elementary Education (SMEE) major.

Want to learn more? Visit our web site:

[www.stthomas.edu/mathematics](http://www.stthomas.edu/mathematics)

## Course recommendations

Depending on a student's goals, the Department of Mathematics recommends particular courses as a part of, or in addition to, the student's required program courses:

- Students who plan to go to graduate school in mathematics or a closely related area should take MATH 301 (Abstract Algebra I), MATH 302 (Abstract Algebra II) and MATH 419 (Complex Variables). Many graduate schools prefer students to have taken other 400-level courses as well. Students should pursue French, Russian or German as a foreign language since these are the most prevalent foreign languages in the mathematics literature.
- Students who wish to enter a professional school (e.g., law or medicine) should take MATH 303 (Statistics for the Applied Sciences) or both MATH 313 (Probability) and MATH 314 (Mathematical Statistics), as well as a variety of courses in other departments, making sure that the entrance requirements for professional school will be satisfied.
- Students who are interested in mathematical computing should take MATH 385 (Numerical Analysis), as well as selected courses in Computer and Information Sciences.
- All students majoring in mathematics are encouraged to use elective courses to broaden their background in mathematics or in a related area of special interest. Coursework in biology, chemistry, economics, engineering, finance, geology, physics, psychology and quantitative methods/computer science combines well with a major in mathematics.

## Actuarial Science program

The Department of Mathematics is also home to the program in actuarial science, an interdisciplinary degree program (see the actuarial science brochure or visit our Web site).

## Minor in mathematics

The minor in mathematics requires the following courses:

- MATH 113 (Calculus I) OR 108 AND 109 (Calculus with Review I and II)
- MATH 114 (Calculus II)
- MATH 200 (Multi-Variable Calculus) OR MATH 210 (Introduction to Differential Equations and Systems)
- Plus a minimum of 12 additional math credits in courses numbered 200 or above, 8 of which must be taken at St. Thomas.

## Opportunities outside the classroom

**Center for Applied Mathematics** organizes student research, forms strong ties with area industry and coordinates regular mathematics talks. Students benefit from colloquia and seminars addressing applied mathematics problems, careers and professional activities. Students can engage in research projects in several areas of applied mathematics.

**Computational Science Training for Undergraduate Students in the Mathematical Sciences (CSUMS)**, a program funded by the National Science Foundation, provides opportunities for students to study and apply methods of computational mathematics and statistics. Students in the program take courses in computational mathematics and engage in paid research, working closely with faculty mentors. Examples of research projects are tornado genesis, new treatments in cancer and cell motility. There is support for students to travel and present their results at professional meetings.

**The Math and Actuarial Science Club** provides an opportunity for members to learn more about mathematics and its applications by sponsoring speakers and social events. Majors and other students interested in mathematics meet and interact with fellow classmates, professors and alumni, allowing them to expand their network and to learn more about areas of interest. Meeting topics have included “Knots and Nature,” actuarial science exam prep and practical applications of probability and statistics.

**Math competitions**, regional and national, include the annual North Central Section of the Mathematical Association of America Competition, the William Lowell Putnam Mathematical Competition and the Konhauser Problemfest.

**The Mathematics Resource Center (MaRC)** supports student learning in mathematics through free drop-in peer tutoring for any student taking MATH 100 through 200. The MaRC also provides math placement exam services.

**Study abroad** opportunities are available around the world for math majors, allowing them to develop cultural experiences and communication skills that are valued in the work force as well as at graduate and professional schools.

## About St. Thomas

The University of St. Thomas is a Catholic, comprehensive university that fosters a tradition of service to the public and an energetic, thoughtful approach to the challenges of contemporary life. Serving 11,000 undergraduate and graduate students, St. Thomas is located in Minnesota's Twin Cities of St. Paul and Minneapolis.

### Contact Information

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