



Jones Hall

Mathematics and Statistics

Over the centuries, mathematics has continued to flourish and to expand. It has done so because of its incredible applicability to so many areas. In fact, mathematics is largely responsible for the rapid rate of growth of modern technology. Not all who study mathematics will become mathematicians, but they will find that their ability to think about and solve problems has been greatly enhanced.

Employment Opportunities

Studying mathematics as an undergraduate can lead to a career in:

- **Operations research:** applying mathematics to help companies make business decisions
- **Scientific mathematics:** solving applied mathematics problems in science and engineering
- **Statistics:** interpreting and analyzing data
- **Mathematics research:** searching for new mathematical truths, done mainly by those with Ph.D. degrees
- **Actuarial science:** calculating risks, premiums, etc. for insurance companies
- **High school teaching of mathematics:** teaching of mathematics in grades 7 - 12.

Youngstown State University graduates who majored in mathematics have chosen a diverse range of careers. Employers of mathematics and statistics alumni include the Mayo Clinic, the United States Treasury Department, the Department of Defense, the National Security Agency, Watson Wyatt Worldwide, Towers Perrin, Eastern Software, EDS, and MCI. A number of mathematics majors also work in the insurance industry as actuaries and data analysts. Graduates with a Bachelor of Science in Education are employed by school districts in Ohio, Pennsylvania, and other states.

Degree Options

The Department of Mathematics at YSU offers coursework toward three degrees, all with a major in mathematics: Bachelor of Arts, Bachelor of Science, and Bachelor of

Science in Education. If you are considering high school teaching as a career, you should work toward a Bachelor of Science in Education degree. YSU also offers a master's degree in mathematics. Many mathematics majors have continued to study at the University in pursuit of this degree.

A popular program for students involves obtaining a double major in mathematics and computer science. Other students have found suitable matches of mathematics with such subjects as economics, engineering, and political science. A considerable number of YSU graduates have also continued their studies to obtain doctoral degrees in mathematics, statistics, or computer science from other universities.

Faculty

The Department of Mathematics faculty, all of whom hold Ph.D. degrees, are qualified to help students at every level of their University study. Faculty research interests include analysis, algebra, topology, numerical analysis, combinatorics, probability and statistics, applications of mathematics, operations research, and mathematics education.

Youngstown State University maintains a faculty-student ratio of 1:19, among the best of state-affiliated universities in Ohio.

Facilities

The Department of Mathematics is located in Cushwa Hall, which houses classrooms, laboratories, offices, conference/seminar rooms, and lecture halls.

Three state-of-the-art computer classrooms are housed within the department. These classrooms allow students to interact with mathematical and statistical software such as Maple, SPSS, MatLab, and ALEKS to learn concepts, explore topics, and complete assignments.

Outside the Classroom

- **Student organizations.** Students are encouraged to join mathematical student organizations that offer a wide range of professional and social activities. These organizations include the student chapter of the Mathematical

Association of America (MAA) and Pi Mu Epsilon, the mathematics honor society.

- **Competition.** Every summer, five to twelve students travel to meetings of the MAA and Pi Mu Epsilon to deliver mathematical presentations and compete for cash awards. YSU students are consistent award winners. Past conferences have been held in Georgia, Vermont, Washington, and British Columbia. During the winter, teams of three students each compete in an international mathematical modeling competition. Teams spend more than 48 hours over the course of a weekend using a variety of resources to apply mathematics to model a real world problem. Every year, YSU has placed within the top 15% of all competing universities. For the last few years several students have participated in the annual William Lowell Putnam Competition, a national event, and for more than a decade many students have matched their skills against each other during the Department's Annual Calculus Competition.
- **Mentoring and research.** You will collaborate frequently with the faculty member you choose to be your mentor for your senior project. Faculty will also encourage you to participate in conferences in mathematics and statistics, such as YSU Pi Mu Epsilon's regional conference, the annual Ohio section meeting of the MAA, and conferences about careers that use statistical understanding. For students wishing to conduct mathematical research over the summer, faculty can be helpful in obtaining fellowships and in writing letters of recommendation for an application to a Research Experience for Undergraduates. There are even opportunities to study abroad available.
- **Job Opportunities.** The department offers some opportunities for student employment. You might type mathematical manuscripts, perform data entry and statistical analysis of placement-exam scores, maintain computer systems, or help to maintain the department's Web page. You may also be interested in working as a tutor in the Mathematics Assistance Center, which aids students in introductory math and statistics courses.
- **Social Events.** The department holds a homecoming tailgate party and a spring formal each year. All events are well attended by both faculty and students.

Curriculum Overview

Core courses

Calculus 1, 2, 3
 Discrete Mathematics
 Linear Algebra and Matrix Theory
 Abstract Algebra 1
 Real Analysis

Senior Undergraduate Research or Thesis
 Probability and Statistics
 Programming and Problem-Solving

Additional requirements specified for the individual B.S. degree programs in mathematics include:

Traditional Mathematics Track

Real Analysis 2
 Abstract Algebra 2
 Intro to Topology
 Complex Variables
 Numerical Analysis 1 **or** Differential Equations **or**
 Operations Research

Statistics Track

Numerical Analysis 1
 Operations Research
 Theory of Probability
 Theory of Statistics
 Probability and Statistics
 Applied Statistics
 Statistical Computing
 Regression Analysis
 Categorical Data Analysis **or** Nonparametric Statistics
or Multivariate Statistical Analysis

Applied Mathematics Track

Differential Equations
 Numerical Analysis 1
 Intro to Combinatorics and Graph Theory
 Operations Research
 Probability and Statistics
 Theory of Probability
 Programming and Problem-Solving
 Data Structures and Objects

Quantitative Business Track

Operations Research
 Numerical Analysis
 Applied Statistics
 Operations Management
 Information Systems for Management
 Financial Accounting
 Business Finance
 Intro to Professional Ethics
 Programming and Problem-Solving
 Data Structures and Objects
 Microeconomics and Macroeconomics
or Intermediate Microeconomics Theory and
 Intermed. Macroeconomic Theory

For more information about this program, go to

<http://www.math.ysu.edu/>



To obtain the Undergraduate Admissions and Financial Aid Application and/or a copy of the current Undergraduate Bulletin, please contact the Office of Admissions at:

Telephone: (877) 468-6978 330-941-2000 TDD: 330-941-1564 Fax: 330-941-3674 E-mail: enroll@ysu.edu

The Office of Admissions is open Monday and Thursday, 8:00 a.m. to 6:00 p.m., and Tuesday, Wednesday, and Friday, 8 a.m. to 5 p.m. The Office is also open every other Saturday from 9 a.m. to noon, except on holiday weekends and during term breaks