



# Mathematics & Statistics

COLLEGE OF SCIENCE AND HEALTH

## Undergraduate Programs

### Majors:

- Mathematics
- Mathematics Education
- Mathematics with Applied Emphasis
- Statistics
- Statistics: Concentration in Actuarial Science

### Minors:

- Mathematics (traditional)
- Mathematics Elementary/Middle Education
- Statistics

The Department of Mathematics and Statistics offers courses for mathematics majors through the College of Science and Health and the School of Education. Most mathematics majors require 36 to 40 credits. Class sizes are small; calculus classes are typically 25 to 30 students and upper level classes are typically 10 to 20 students.

## Department Overview

Mathematics is the science and art of pattern and idea; statistics is the science of collecting, analyzing, and making inferences from data. There is no area that does not require some form of mathematical or statistical thought. It is an integral part of the liberal arts education and is the foundation for many areas of study. In filling many roles at UW-La Crosse, the Department of Mathematics and Statistics serves a diverse group of students; we nurture all liberal arts students, give students a solid foundation from which to study both the natural and social sciences, provide the tools needed by students in professional programs, and cultivate mathematics and statistics majors. As disciplines, mathematics and statistics can be studied by themselves or in conjunction with other fields such as the biological and life sciences, physical sciences, engineering, and social sciences.

Students who graduate with degrees in mathematics or statistics pursue a wide variety of careers. Our math education majors are sought after to fill a huge need for quality math teachers in our country. Many of our statistics and applied math majors go on to jobs in industry as analysts, statisticians, and actuaries while others go on to professional programs such as law, medicine and health professions, or business. With degrees from our program, students have gone to graduate programs in mathematics, applied mathematics, statistics, engineering, and computer science.

The faculty of the Department of Mathematics and Statistics is committed to being excellent teacher-scholars. Members of the department are involved in research in areas of algebra, analysis, topology and geometry, statistics, applied mathematics, numerical analysis, education, and combinatorics and graph theory. This research is widely published in prestigious research journals, and many faculty have received numerous grants. Technology is integrated into both the teaching and research in the department. Many students participate in undergraduate research projects that result in publications and presentations at national conferences.

Mathematics and statistics are interesting and lively subjects. Mathematics has both an aesthetic and a practical appeal; the enjoyment of problem solving, abstract thinking, and structural beauty draws many to mathematics. Statistics helps us understand and describe phenomena in our world and to help us draw reliable conclusions about those phenomena. The challenge and satisfaction of using mathematics and statistics to solve real world problems provides an equally strong appeal. #UWLmath

# Mathematics & Statistics

## COLLEGE OF SCIENCE AND HEALTH

### Program Coursework

All of the mathematics majors require the core calculus sequence. Other required courses, as well as the particular electives allowed, vary by the particular major.

#### MATHEMATICS

- Calculus I
- Calculus II
- Logic and Discrete Mathematics
- Linear Algebra with Differential Equations
- Calculus III: Multivariable Calculus
- One of: Number Theory, Graph Theory, Modern Geometry
- One of: Differential Equations, Complex Variables, Numerical Methods
- Two of: Real Analysis I, Abstract Algebra I, Topology
- Two Elective Courses

#### MATHEMATICS EDUCATION

- Calculus I
- Calculus II
- Logic and Discrete Mathematics
- Probability and Statistics
- Linear Algebra with Differential Equations
- Calculus III: Multivariable Calculus
- Teaching Mathematics with Technology
- Modern Geometry
- Teaching & Learning Math and CS in the Secondary School
- Two Elective Courses

#### MATHEMATICS WITH APPLIED EMPHASIS

- Calculus I
- Calculus II
- Logic and Discrete Mathematics
- Linear Algebra with Differential Equations
- Calculus III: Multivariable Calculus
- Differential Equations
- Numerical Methods
- Mathematical Physics OR Studies in Applied Mathematics
- Three Elective Courses

#### STATISTICS

- Calculus I
- Calculus II
- Probability and Statistics
- Linear Algebra with Differential Equations
- Calculus III: Multivariable
- Statistical Methods
- Statistical Consulting
- Mathematical Statistics I
- Mathematical Statistics II
- Correlation and Regression Analysis
- Analysis of Variance and Design of Experiments
- One Elective Course

#### STATISTICS: CONCENTRATION IN ACTUARIAL SCIENCE

All courses required for Statistics plus the following courses:

- Microeconomics and Public Policy
- Global Macroeconomics
- Accounting Principles I
- Accounting Principles II
- Principals of Financial Management

## Department Features

Course offerings include the areas of calculus, differential equations, logic, geometry, linear and abstract algebra, real and complex analysis, numerical methods, graph theory, number theory, probability, statistics, operations research and various applied mathematics areas.

Many mathematics majors and minors also major or minor in chemistry, computer science, physics and business. The department also has an adviser who works closely with elementary education students who wish to minor in mathematics; a mathematics minor is a strong complement to an elementary education major.

Outside the classroom, there are many opportunities for students to actively pursue their interests in mathematics and statistics.

- A student run Mathematics and Statistics Club meets at various times during each semester. Activities include talks by students and invited speakers, picnics, travel to conferences and friendly sporting contests with other clubs or faculty.
- Students work with faculty on research projects. These students have the opportunity to present their results at state and national meetings and publish their results in the UWL Journal of Undergraduate Research.
- Students can participate in local, regional and international mathematics or statistics modeling contests.
- Mathematics and Statistics Resource Room is located within the department. This room is a place for math majors to study and socialize. There are also computers available for use.
- Math majors can work from 5 to 15 hours a week as a tutor in the Murphy Learning Center or as a peer teaching assistant.
- Students can obtain internships and part-time jobs with local business and engineering firms, public utilities, and medical and governmental research institutions.

## Career Opportunities

Demand has been strong, and promises to be so in the future, for the mathematically trained person. Some graduates choose to further their education by attending graduate school in mathematics or a related discipline. For those entering the job market, graduates have found numerous job opportunities that utilize their knowledge and competencies.

### SAMPLE OF JOB TITLES OF GRADUATES

- Manager of Manufacturing Process Engineering, Corning, Inc.
- Actuary, General Casualty Company in Sun Prairie, WI
- Plant Manager, Sunshine Biscuits
- Professor of Statistics, Oberlin College
- Director of the Mathematics and Statistics Learning Center, The Ohio State University
- Statistician, State of Wyoming
- Loan Officer, State Bank of Wonewoc
- Actuary, Blue Cross-Blue Shield of Florida
- Mathematics Teacher, Wisconsin Dells High School
- Senior Statistician, Pharmacia & Upjohn
- Marketing Specialist, IBM in Rochester, MN
- Mathematics Teacher, Platteville High School
- Associate Professor of Mathematics, Wabash College
- Software Developer, Mayo Clinic
- Programmer, IBM at North Carolina-Research Triangle Park
- Marketing Database Analyst, Sportsman's Guide, Inc.
- Mathematics and Physics Teacher, Sheboygan High School
- Data Analyst, Department of Health Science Research, Mayo Clinic
- Mathematics Teacher, Central High School, La Crosse
- Property-Casualty Actuary, Hartford Insurance Company
- Mathematics Teacher, Peace Corps Volunteer in Western Kenya
- Supplier Quality/Component Engineer, Guidant Corp., St. Paul, MN

## Occupational Outlook

According to the Bureau of Labor Statistics, employment of math occupations is projected to grow 28 percent from 2014 to 2024, which will result in about 42,900 new jobs. Growth is anticipated as businesses and government agencies continue to emphasize the use of big data, which math occupations can analyze. Seven of the top ten occupations for 2015 were math-related.