

# MATHEMATICAL SCIENCES

COLLEGE OF LETTERS & SCIENCE | MONTANA STATE UNIVERSITY

## A FORMULA FOR SUCCESS

The Department of Mathematical Sciences provides unique opportunities for innovative instruction and cooperative research. With approximately 30 Ph.D. faculty, 100 undergraduate majors and 100 graduate students, the department is large enough to attract and retain the most capable faculty, but small enough to allow faculty and students an intimate atmosphere for the easy exchange of ideas.

Research is conducted in both pure and applied mathematics with emphases in dynamical systems, mathematical biology, and applied and computational mathematics.

Statistics research also encompasses a broad range of theoretical and applied topics with several interdisciplinary opportunities including the environmental and biological sciences.

Mathematics education research addresses applied and practical areas including teacher preparation, coaching and mentoring for in-service teachers, online learning research, problem-based learning and curriculum development for K-12 mathematics.

The Department of Mathematical Sciences is recognized as a leading department in mathematics, mathematics education, and statistics in the Rocky Mountain region. Bachelors, masters and doctoral graduates in all areas are following successful careers in industry, government and academia.

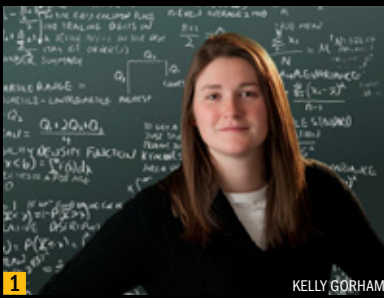
## OPPORTUNITIES IN MATHEMATICAL SCIENCES

**Study abroad:** Study abroad in countries such as England, Turkey and New Zealand.

**Honors courses:** Honors courses are available in Calculus I, Calculus II, Multivariable Calculus and Ordinary Differential Equations.

**Research opportunities:** There are research opportunities for undergraduate students either in the classroom (Software Applications in Mathematics), one-on-one with individual faculty, or through internships.

**Undergraduate workshops:** The department has an active undergraduate workshop series covering careers, graduate schools, study abroad, internships and undergraduate research opportunities.



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KELLY GORHAM



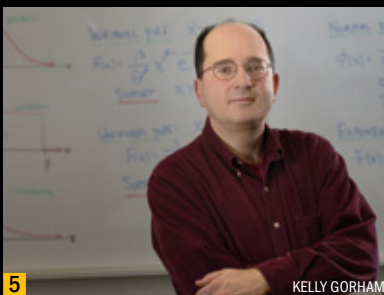
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KELLY GORHAM

1 Jamie Thornton, a math major and center on the MSU women's basketball team 2 Extensive work is done to monitor the Greater Yellowstone Ecosystem 3 Mathematicians are involved in an interdisciplinary study of thermal spring microbial life in Yellowstone National Park 4 Interdisciplinary opportunities include analysis of glaciated valleys 5 Dr. John Borkowski, Letters and Science Distinguished Professor and Fulbright Lecture Award recipient

**For additional information, contact:**  
Department of Mathematical Sciences  
Montana State University  
2-214 Wilson Hall  
P.O. Box 172400  
Bozeman, MT 59717-2400

Tel: 406-994-3601  
Fax: 406-994-1789

[www.math.montana.edu](http://www.math.montana.edu)  
[math@math.montana.edu](mailto:math@math.montana.edu)



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## Options within Major

- Applied Mathematics
- Mathematics
- Mathematics Teaching
- Statistics

## Specialized Areas of Study/Minors

- Mathematics (non-teaching)
- Statistics (non-teaching)
- Mathematics Teaching

## Graduate Programs

- M.S. in Mathematics
- M.S. in Mathematics Education (online)
- M.S. in Statistics
- Ph.D. in Mathematics
- Ph.D. in Mathematics Education
- Ph.D. in Statistics

## Accelerated M.S. Program

With careful planning, a student can earn both a B.S. and a M.S. in five years.

## Research Areas

- Adaptive cluster sampling
- Complex dynamics
- Continuum theory
- Dynamics of iterated maps
- Knowledge for mathematics coaching
- Knowledge construction in online courses
- Numerical analysis
- Reasoning and proving in teaching and learning
- Scientific computation
- Sensitivity theory
- Spatial statistics
- Statistical computing
- Tiling spaces

## Interdisciplinary Opportunities

- Analysis of glaciated valleys
- Bacterial biofilms
- Control of guidance systems
- Environmental statistics
- Fluid dynamics
- Gene regulation modeling
- Greater Yellowstone Ecosystem monitoring
- Hazardous waste assessment
- Mathematical biology
- Modeling atmospheric data
- Neuroscience
- Statistical ecology

**6** *Biofilm modeling in collaboration with the Center for Biofilm Engineering*

## WHERE CAN I WORK WITH A DEGREE IN MATHEMATICAL SCIENCES?

**Aerospace industry:** Companies such as Aerospace Corporation, Boeing, Goodyear Aerospace, Lockheed Martin and Raytheon

**Computer software and hardware industry:** Companies such as Intel, Microsoft, Century Link (formerly Qwest), RightNow Technologies and Zoot Enterprises

**Federal government agencies:** Examples include the Internal Revenue Service and the National Security Agency

**Research laboratories:** National research laboratories, such as Argonne, Idaho, Los Alamos and Pacific Northwest, and private research laboratories such as the Santa Fe Institute

**State government:** Montana University System (MUS) Employee Benefit Program, Montana Fish, Wildlife and Parks, Montana Office of Public Instruction, and Department of Public Health and Human Services

**Teaching:** K-12 or universities

**Pharmaceutical industry:** Companies such as Abbott, Bristol Myers Squibb, Eli Lilly and GlaxoSmithKline

## GREAT LEARNING FACILITIES

**Mathematics Education Classroom:** This lab consists of several PC's, projection system, digital document camera, smartboard, and graphing calculators in a math education learning environment suitable for teaching K-12 math teaching techniques.

**Mathematics Learning Center:** The Department of Mathematical Sciences manages a free drop-in tutoring center, which provides tutoring services for most 100- and 200-level math and statistics courses.

**Mathematics Testing Center:** This center provides a convenient and quiet environment for pre-arranged testing.

**Multi-media Computing Lab:** This lab offers 28 workstations with retractable flat screen monitors, projection system, digital document camera, DVD/sound in a high-tech setting suitable for multimedia lectures and presentations.

**Seminar/Department Library:** This room offers space for small study groups and instructor-led sessions.

**Student Computer Lab:** This lab consists of several UNIX workstations and PC's, and is available for student use weekdays and evenings.

