

# MATHEMATICAL SCIENCES

## Do Math Here.

Mathematics is the core of engineering and the quantitative sciences. Study it here in its many forms: Pure Math– the foundation of modern physics; Combinatorics and Graph Theory- the backbone of logic and computation; Statistics, which informs and shapes the experimental sciences; Mathematics Education– how do we create a mathematically literate society?

Join us in exploring mathematics, whether it be as a major or a minor. Building your mathematical acumen can only enhance your future opportunities and your contribution to the world.



**UM Math majors can study a variety of sub-areas within Mathematics, do joint majors with Computer Science or Physics, or complete their teacher training with a specialty in Math Education.**





## Pure math.

This may be what you think of when you think "math". Fermat's last Theorem. Pascal's triangle. Explore it with some of the best researchers in the Pacific Northwest. Here are some broad categories for the things we study.

- **Algebra:** Not your high school Algebra! Discover the world of groups, rings and fields.
- **Topology:** How is a donut like a coffee cup? To a topologist, they are indistinguishable.
- **Combinatorics:** The art of counting, the Mathematics of patterns. Where Math and Computer Science overlap.
- **Analysis:** Not your AP Calculus! What happens when Calculus breaks down and Physics gets into the act?



UM class sizes are small: from Calculus capped at 30, to upper division courses with typically 10-15 students. The major:faculty ratio is a low 8:1. Each year the Department grants more than \$25K in merit-based scholarships and awards, with a range of \$1000-\$3500 per award.

# Statistics and Applied Math

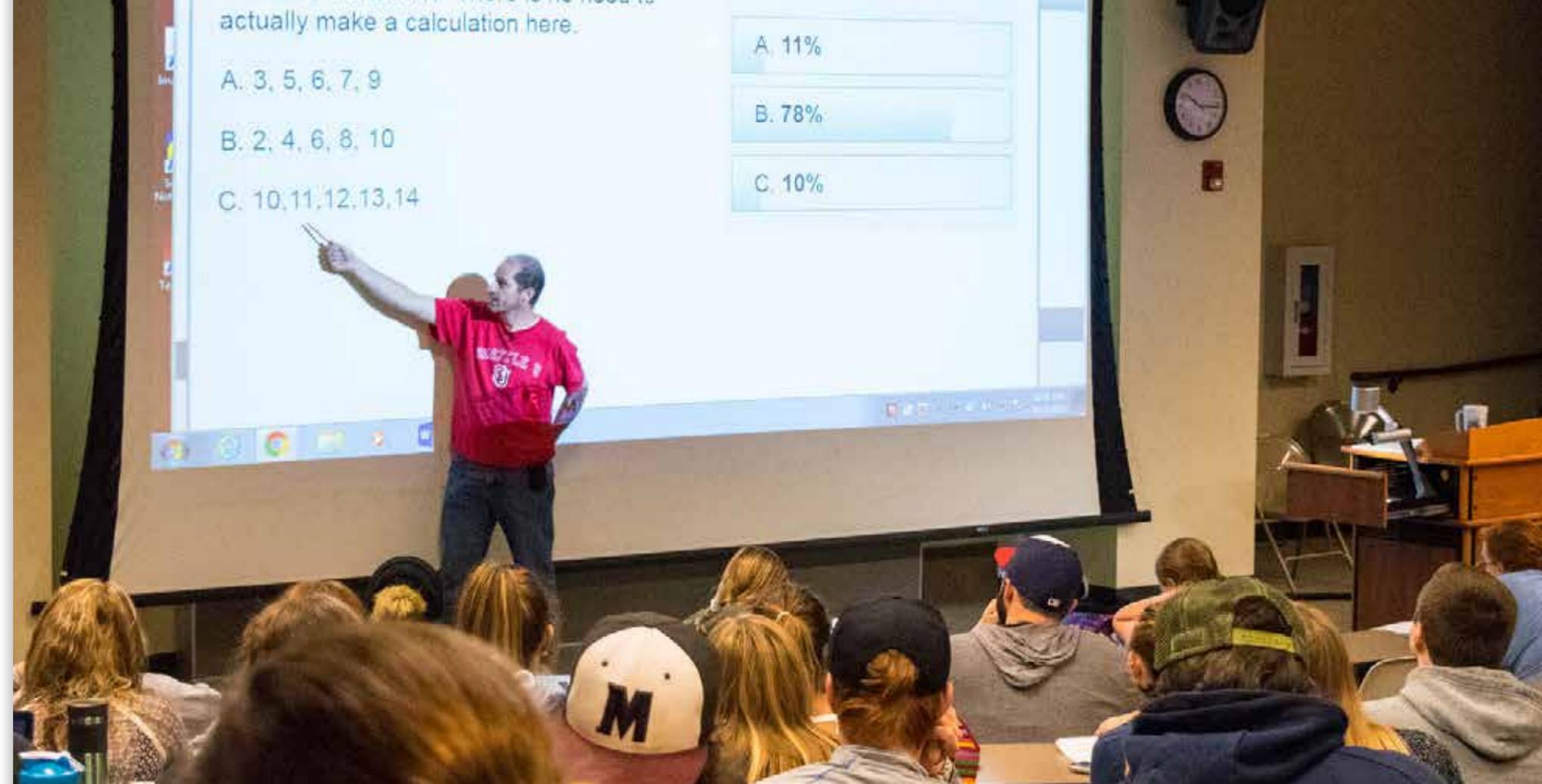
## Statistics: A world of Data

- Learn data analysis techniques at the forefront of modern statistics: multivariate methods, generalized linear mixed models, statistical learning
- Application areas range from Human Health and Performance to climatology and wild land fire
- Learn best practices in design of experiments and construction of statistically reliable model predictions

## Our Applied Math faculty work in diverse areas.

- Discover the techniques of mathematical physics
- Image processing: From distant galaxies to fMRI
- Modeling: from disease spread to chemical reactions

**> Statistics and Applied Math students can work on projects through the Math Dept. Consulting CORE, under the direction of the faculty. The CORE provides researchers at the University of Montana and in the wider community with expertise in data analysis, modeling, optimization and experimental design.**



## Data Analytics at UM

An innovative, industry-centered program to train students for careers in data science.

- Our specialized courses in data analytics build on core courses in statistics and computer science to give students the techniques they will need to create, use and interpret the algorithms of data analytics. We combine data analytics theory with practice on real big data problems from actual clients.
- At the undergraduate level you can earn a University certificate in Data Analytics, which allows students to focus in Math & Computer Science, or Business Management and Information Science.
- Our goal is to produce graduates that have faced the challenges of big data and are ready to be effective employees. We want our graduates to be productive on the first day of the job.

**"There will be a shortage of talent necessary for organizations to take advantage of big data. By 2018, the United States alone could face a shortage of 140,000 to 190,000 people with deep analytical skills as well as 1.5 million managers and analysts with the know-how to use the analysis of big data to make effective decisions."**

(McKinsey Global Institute)





**" 'We learn from people around us with whom we identify. We can't help learning from them and we learn without knowing that we are learning.' - Frank Smith, *The Book of Learning and Forgetting*. For learning mathematics it's hard to find a better situation in terms of access to quality individuals than at UM."**

## Mathematics Education

By 2018 , it is predicted that 2.4 million STEM (Science, Technology, Engineering and Math) jobs will go unfilled. Now, perhaps more than ever, the world need mathematics teachers who are strongly committed to teaching mathematics with understanding. Join us as we work to address the world's rising needs in mathematical literacy. Your preparation will include:

- A strong foundation in classical mathematics content that includes courses in algebra, geometry, calculus and statistics and probability.
- Exposure to modern and powerful methods of teaching mathematics including the proficient use of technology to create dynamic and active learning environments.
- Clinical field experience in classrooms distributed across the second, third and fourth years of study.
- A liberal arts treatment of mathematics that emphasizes the learning of mathematics as a human endeavor with its own history, culture and means of communication.



"One of the special characteristics of the UM Math Department is its unique faculty and their personalized program that provides support to each student in pursuing their goals. I was part of a research team that allowed me to develop research and career skills such as writing papers and grant proposals." Ricela Feliciano-Samidei, PhD Candidate.

## Your Future Starts Here.

### Graduate school

As well as graduate work in Mathematics and Statistics, our students have gone on to study a wide variety of topics for which a rigorous background is essential such as Engineering, Neuroscience, Chemistry, Physics and Astronomy.

### Masters in Data Science at UM

You can continue your career preparation with a 2 year degree in Data Science. Options for 5 year combined BA/MS are also available. FACT: 90% of data scientists have advanced degrees. (source: Burtch Works, 2017)

### Careers in Mathematics

Teaching Math in Public & Schools (Math Ed), Industry Analysts (Statistics and Applied Math), Cryptographer (pure math), Actuary (Statistics), Investment Analyst (Statistics and Applied Math), Operation Research Analyst (pure math), Data Analyst (Statistics and Applied Math), Software Tester (All areas).

Our graduates work in a variety of areas, for a variety of companies:

**Institute for Defense Analysis, Washington, DC**  
(Research Staff Member)

**Swift, Inc. Portland, OR**  
(Data Strategist)

**Workiva, Missoula, MT**  
(Software Developer)

**Fast Enterprises, Centennial, CO**  
(Implementation Consultant)

**Hellgate Highschool, Missoula, MT**  
(Math Teacher)

**MSU Billings, Missoula College, Bitterroot College, MT** (Math Instructor)

To Name just a Few!

## UM Community.

The University of Montana, with an enrollment of around 11,000 students, is located in the river valley town of Missoula. The backdrop of the Rocky Mountains provides easy access to downhill and cross country skiing, camping, backpacking, hiking, mountain biking, kayaking, canoeing, hunting and fishing.

Missoula itself combines small-town friendliness and comfort with big-city entertainment, energy, and convenience. It is just a short walk from campus to a spirited and vibrant downtown, with diverse restaurants, cafes, art galleries, live theater and an eclectic music scene. Missoulians are smart, friendly, ambitious, adventurous and welcoming. Warning: there is a community spirit here that is highly contagious!

Sunset view over the Missoula valley looking toward Lolo peak and the Blue Mountain Range. Higgins and Orange Street bridges span the Clark Fork river, with the iconic Wilma Theater building in the foreground at the north end of the Higgins Street Bridge. >





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