



## B.S. in Applied Mathematics & Statistics - Computational & Applied Math Emphasis

The Applied Mathematics and Statistics (AMS) department supports undergraduate and graduate students in Computational & Applied Mathematics and Statistics and conducts research in scientific computing, multivariate analysis, numerical analysis, spatial statistics, wave theory, biostatistics, multi-scale simulation, partial differential equations, inverse problems, uncertainty quantification and bio-mathematics.

Mathematics and Statistics are the building blocks for engineering and the sciences. Through extensive coursework, AMS students gain the knowledge and skills to succeed in a variety of career paths including computer information and software firms, energy systems firms, government agencies, consulting firms, engineering research labs and academic institutions, to name a few. As an example, the senior capstone engages our students in solving problems of practical applicability for potential employers. This course is designed to simulate an industrial job or research environment; in small teams, students work for a client, make weekly reports and present final written and oral reports. The close collaboration with potential employers and professors improves students' communication, time management skills, and builds a sense of confidence.

### Internships & Careers

Throughout our program, there is substantial focus on the development of practical applications and techniques to enhance the overall attractiveness and competitiveness of our students to a wide range of employers such as Lockheed Martin, Motorola, Raytheon Systems and British Petroleum, among many others. Examples of what Mathematicians and Statisticians do include: deriving and analyzing models to resolve practical problems, comparing inferences from models with observations or experiments, finding and exploring new patterns and principles and developing computational methods and computer codes.

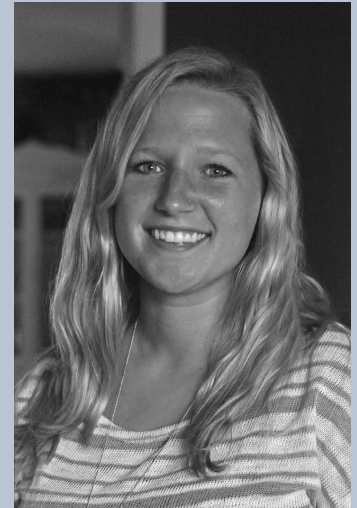
In addition, summer internships provide a tremendous opportunity to learn valuable work skills, hone in on career interests, establish contacts and networks, identify strengths and weaknesses and apply coursework to the world of work. Examples of recent internships include work with LGS Innovations, Salesforce, Raytheon and the National Wildlife Research Center.

According to the 2014 Colorado School of Mines salary survey, Mathematics and Statistics B.S. graduates are offered an average salary of \$59,542 and according to the 2012 Bureau of Labor Statistics, employment of mathematicians is projected to grow 21 percent from 2014-2024, much faster than the average for all occupations.

### Student Experience

Mines students will tell you that living in Colorado offers many opportunities to take a break from the books and enjoy a healthy outdoor and community life.

With over 170 student organizations, clubs and recreation activities, Mines students excel in their academics while pursuing diverse interests and enjoying balanced, active college lives. The Society of Women in Mathematics (SWiM), Kappa Mu Epsilon, Math Club, Putnam, and the Actuarial Club are of particular interest to AMS students. Not to mention, our campus sits at the foot of the Rocky Mountains - which means Colorado's playground is right in our backyard. At the Colorado School of Mines, life is rich and rewarding both inside and outside of the classroom.



**After I graduated from Mines, I worked in a Cloud Systems group and spend my days solving problems involving large storage systems running cutting edge, open source, cloud software.**

**The most useful skills that I acquired from my Mines degree are the ability to solve complex problems, the ability to think critically and the dedication to hard work."**

~ Caroline Arnold

**B.S. Applied Math & Statistics-CAM emphasis  
\*Currently now Systems Engineer for Time Warner Cable**

### DEPARTMENT QUICK FACTS

**108 Undergraduate Students**

**32 Graduate Students**

**23 Faculty**

# 2016-17 Computational & Applied Mathematics Curriculum

## Freshman Year

Fall Semester			Credits	Spring Semester			Credits	
MATH111	Calculus for Scientists & Engineers I	4	MATH112	Calculus for Scientists & Engineers II	4			
CHGN121	Principles in Chemistry I	4	PHGN100	Physics I - Mechanics	4.5			
LAIS100	Nature & Human Values	4	EBGN201	Principles of Economics	3			
CSCI101	Introduction to Computer Science	3	EPIC151	Design (EPICS) I	3			
CSM101	Freshman Success Seminar	0.5	PAGN102	Physical Education	0.5			
PAGN101	Physical Education	0.5						
			<b>TOTAL</b>				<b>16 credits</b>	<b>TOTAL 15 credits</b>

## Sophomore Year

Fall Semester			Credits	Spring Semester			Credits	
MATH213	Calculus for Scientists & Engineers III	4	MATH201	Probability and Statistics for Engineers	3			
MATH225	Differential Equations	3	MATH332	Linear Algebra or MATH 342	3			
PHGN200	Physics II - Electromagnetism & Optics	4.5	CSCIXXX	Computer Science Elective*	3			
CSCI261	Programming Concepts	3	LAIS200	Human Systems	3			
PAGN2XX	Physical Education	0.5	FREE	Free Elective	3			
			PAGN2XX	Physical Education	0.5			
			<b>TOTAL</b>				<b>15 credits</b>	<b>TOTAL 15.5 credits</b>
Summer Session			Credits					
MATH310	Introduction to Math Modeling	4						

## Junior Year

Fall Semester			Credits	Spring Semester			Credits	
MATH300	Foundations of Advanced Mathematics	3	MATH301	Introduction to Analysis	3			
MATH307	Introduction to Scientific Computing	3	MATH335	Introduction to Mathematical Statistics	3			
MATH331	Mathematical Biology	3	MATH408	Computational Methods for Differential Equations	3			
MATH334	Introduction to Probability	3	MATH454	Complex Analysis	3			
LAIS/EBGN	Humanity and Social Science Elective I	3	LAIS/EBGN	Humanity and Social Science Elective II	3			
			<b>TOTAL</b>				<b>15 credits</b>	<b>TOTAL 15 credits</b>

## Senior Year

Fall Semester			Credits	Spring Semester			Credits	
MATH455	Partial Differential Equations	3	MATH440	Parallel Scientific Computing	3			
MATH458	Abstract Algebra	3	MATH484	Mathematical & Computational Modeling (Capstone)	3			
MATHXXX	Mathematics- CAM Elective**	3	MATHXXX	Mathematics- CAM Elective**	3			
MATHXXX	Mathematics- CAM Elective**	3	LAIS/EBGN	Humanity and Social Science Elective III	3			
FREE	Free Elective	3	FREE	Free Elective	3			
FREE	Free Elective	3						
			<b>TOTAL</b>				<b>18 credits</b>	<b>TOTAL 15 credits</b>

**DEGREE TOTAL HOURS: 128.5 credits**

For the most accurate and up-to-date curriculum information, please refer to the Undergraduate Bulletin

\* May be satisfied by CSCI262 or any other approved computationally intensive course

\*\* CAM area of emphasis electives include: Functional Analysis, Complex Analysis II, Advanced Statistical Modeling, Numerical PDEs, Integral Equations, Modelling with Symbolic Software and other appropriate courses with departmental approval



## PROGRAM CONTACT

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