

STATISTICS, MS

Please click [here](#) to see Mathematical and Statistical Sciences department information.

Introduction

The need for workers trained in the science of data analysis continues to grow in industry, government, and academia. This need spans many fields and applications: national security applications (including real-time monitoring of internet trends), environmental applications of climate modeling over space and time, medical and genomic applications that use electronic medical records to correlate demographics, genetic data and clinical outcomes over millions of individuals, and manufacturing with real-time monitoring of features over a variety of processes to both troubleshoot and optimize manufacturing.

The Master of Science in Statistics program at the University of Colorado Denver provides the training necessary to succeed in real-world analysis of data. The degree program is designed to ensure students acquire fundamental statistical knowledge while having hands-on experience in the application of state-of-the-art statistical methods—all while collaborating with world-class researchers. The program emphasizes project-related experiences, helping students to further develop skills in programming, data wrangling, data analysis, interpretation, and presentation in a more realistic environment. The degree program is highly flexible depending on student interest. Students can select from a broad range of electives focusing on different areas of mathematics and statistics or pursue electives in computer science, economics, business, or geography. Alternatively, students can choose to pursue training focused in a specific application area of statistics.

Whatever specialization students choose, graduates with a statistics degree will be prepared for a multitude of careers.

The MS in Statistics requires students to complete 30 hours of accepted coursework and a capstone project. The coursework is organized into four components: 1) core courses, 2) statistics-related electives, 3) other electives, and 4) capstone project. The capstone project is developed within the structure of a student-centered, research-focused course. Full-time students take approximately two years to complete the MS degree.

The degree requires students to complete 15 credit hours through five required courses related to probability, statistical theory, regression, consulting, and the capstone project. Students must complete an additional 15 credit hours related to elective courses, which is generally five graduate courses. For the elective courses, three must be statistics-related while two others are more general (though they are typically math-related courses).

These degree requirements are subject to periodic revision by the academic department, and the College of Liberal Arts and Sciences reserves the right to make exceptions and substitutions as judged necessary in individual cases. Therefore, the College strongly urges students to consult regularly with their Statistics faculty advisor to confirm the best plans of study before finalizing them.

Graduate Education Policies and Procedures apply to this program.

Program Requirements

1. Students must complete a minimum of 30 credit hours of accepted coursework.

2. At least 24 credit hours of accepted coursework must be graduate MATH courses numbered 5000 or above. The remaining six hours must be either MATH courses numbered 5000 or above or approved courses outside the department numbered 4000 or above.
3. Students must earn a minimum grade of B- (2.7) in all courses that apply to the degree and must achieve a minimum cumulative GPA of 3.0. All graded attempts in required and elective courses are calculated in the GPA. Courses taken using P+/P/F or S/U grading cannot apply to program requirements.
4. Students must complete 21 credit hours with CU Denver faculty.
5. All students must take and pass a final oral examination that includes a written report (M.S. non-thesis option) or thesis (M.S. with thesis option). Passing this final oral examination fulfills the requirements of the capstone project.

Program Restrictions, Allowances and Recommendations

1. Up to nine semester hours of prior course work may be transferred in (subject to approval); these must be at the 5000 level or above with a B- or better grade. Courses already applied toward another degree (graduate or undergraduate) cannot be used toward the MS degree in Statistics. Credit cannot be transferred until the student has established a satisfactory record of at least six graduate credits in mathematics or statistics at CU Denver with a minimum GPA of 3.0. All transfer courses must be approved by the Graduate Program Director. Courses taken while registered as a non-degree student are considered transfer courses.
2. According to graduate education policies and procedures, Master's students, whether enrolled full-time or part-time, must complete all degree requirements within seven years of matriculation.
3. The following courses will **not** count toward the degree: MATH 5010 History of Mathematics, MATH 5012 An Advanced Perspective on Number and Operation-MATH 5015 Capstone Course for Secondary Teachers, MATH 5017 Topics in Mathematics for Teachers, MATH 5198 Mathematics for Bioscientists, and MATH 5830 Applied Statistics
4. In relation to completing the capstone project, three-six credits of MATH 5950 Master's Thesis or three credits of MATH 5960 Master's Project can be applied toward the degree. There is no co-credit between MATH 5950 Master's Thesis, MATH 5960 Master's Project, and MATH 6960 Research Methods in Mathematics and Statistics.
5. Students continuing into the PhD program in Applied Mathematics are strongly encouraged to take MATH 5718 Applied Linear Algebra and either MATH 5070 Applied Analysis or MATH 6131 Real Analysis for their "other" electives.

Course Requirements

Students must complete the following coursework:

Code	Title	Hours
<i>Core courses</i>		12
MATH 5310	Probability	
	or MATH 5718 Probabilistic Modeling	
	or MATH 6318 Stochastic Processes	
MATH 5320	Statistical Inference	
MATH 5387	Applied Regression Analysis	
MATH 6330	Workshop in Statistical Consulting	

Statistics-related electives 9

Nine additional credit hours (typically, three courses) from the following choices:

MATH 5337	Intro to Statistical and Machine Learning
MATH 5388	Machine Learning Methods
MATH 5394	Experimental Designs
MATH 5792	Probabilistic Modeling
MATH 6101	Uncertainty Quantification
MATH 6380	Stochastic Processes
MATH 6384	Spatial Data Analysis
MATH 6388	Statistical and Machine Learning
MATH 7384	Mathematical Probability
MATH 7386	Monte Carlo Methods
MATH 7393	Bayesian Statistics
MATH 7826	Topics in Probability and Statistics
Additional courses with prior approval by the student's advisor and the Director of the Program in Statistics.	

Other electives 6

Six additional credit hours (typically, two courses) from the following choices:

Any MATH course applicable to a graduate degree in Applied Mathematics. The following courses will not count toward the degree: MATH 5010, MATH 5012-MATH 5015, MATH 5017, MATH 5198, and MATH 5830.

Courses outside the Department of Mathematical & Statistical Sciences at the 4000 level or above with prior approval by the student's advisor and the Graduate Studies Committee.

Capstone project 3

A minimum of three additional credit hours related to completing the capstone project from the following choices:

MATH 5950	Master's Thesis
MATH 5960	Master's Project
MATH 6960	Research Methods in Mathematics and Statistics

Total Hours 30

To learn more about the Student Learning Outcomes for this program, please visit our website (<https://clas.ucdenver.edu/mathematical-and-statistical-sciences/ms-applied-mathematics-program-goals-objectives/>).