APPLIED MATHEMATICS, PHD

Please click here (http://catalog.ucdenver.edu/cu-denver/graduate/schools-colleges-departments/college-liberal-arts-sciences/mathematical-statistical-sciences/) to see Mathematical and Statistical Sciences department information.

Introduction

Our PhD in Applied Mathematics program provides comprehensive training in applied mathematics and/or statistics and opportunities for cutting-edge research in close collaboration with internationally recognized scholars in the fields of

- Computational Mathematics
- Discrete Mathematics
- Optimization and Operations Research
- Probability
- Statistics

Some highlights of our exciting research projects include evolutionary dynamics, climate modeling, wildfire simulations, machine learning, genetic inheritance and association, optimization in data analysis, and more. Current research funding includes grants from NSF, NIH, DoD, and NASA.

The degree is designed to give students a contemporary, comprehensive education in subjects such as high-performance computing, numerical analysis, optimization, statistical methods, and operations research. In all of its activities, the department embodies the outlook that mathematics, statistics, computing, and data science are powerful tools that can be used to solve problems of immediate and practical importance. Our program emphasizes the training of skills valued by many employers. These skills include problem solving, critical thinking, analysis, facility with data, the ability to process quantitative information, and most important of all, the ability to learn and master new skills and concepts quickly. These strengths make our students highly marketable for careers in industry as well as in academia. Scholarships and assistantships (https://clas.ucdenver.edu/mathematical-and-statistical-sciences/graduate-student-financial-resources/) for graduate students are available and awarded competitively.

The program 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 program 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 70 approved credit hours.
2. Students must complete 40 non-thesis credit hours with CU Denver faculty.
3. Students must complete a minimum of 30 dissertation credit hours.
4. Students must complete all credit hours at the graduate 5000-level and above.
5. Students must earn a minimum grade of B (3.0) or better in all core courses, a B- (2.7) in all other courses applied to the degree and must achieve a minimum cumulative program GPA of 3.0. Courses taken using P+/P/F or S/U grading cannot apply to program requirements.

Program Restrictions, Allowances and Recommendations

1. There are six phases of the PhD program. A candidate must fulfill course requirements, pass the preliminary examinations, establish a PhD committee, meet the academic residency requirement, pass the comprehensive examination and write and defend a dissertation.
2. The following MATH courses will NOT count toward a graduate degree: MATH 5000-5009, 5010, 5012-5015, 5017, 5198, 5250 and 5830.
3. Students must complete 40 semester hours of non-thesis course work at the graduate level (up to 30 hours of this course work may be transferred in, including courses taken as part of a master's degree). In addition, 30 hours of dissertation credit must be taken. One readings course (one semester hour) is required as part of the formal course work.
4. The preliminary examinations are designed to determine that students who intend to pursue the PhD program are qualified to do so. These three examinations must be completed in three of seven introductory graduate classes. Students must pass two of these exams by the start of their fourth semester, and the third by the start of the fifth semester.
5. Six semesters of full-time scholarly work are required, as specified in the Graduate Education Policies and Procedures. All students are strongly advised to spend at least one year doing full-time course work or research with no outside employment.
6. The comprehensive examination is taken after completion of the preliminary exams, completion of at least three semesters of residency, and upon completion of essentially all non-thesis coursework. The exam is designed to determine mastery of graduate-level mathematics and the ability to embark on dissertation research. It consists of a six-hour written examination and an oral follow-up examination. Students must pass the comprehensive exam by the beginning of the 4th year. Within six months after passing the comprehensive examination, the candidate must present a dissertation proposal to their dissertation committee.
7. Each student must write and defend a dissertation containing original contributions and evidence of significant scholarship. The dissertation defense is public and must be given before an approved examining committee.

For more detailed information about the Applied Mathematics PhD, see department website (https://clas.ucdenver.edu/mathematical-and-statistical-sciences/phd-applied-mathematics/).

Code	Title	Hours
Complete the following two courses:		**6**
MATH 5070	Applied Analysis	
MATH 5718	Applied Linear Algebra	
Complete four of the following courses:		**12**
MATH 5387	Applied Regression Analysis	
MATH 5388	Machine Learning Methods	
MATH 5593	Linear Programming	
MATH 5660	Numerical Analysis I	
MATH 6404	Applied Graph Theory	
Complete a minimum of one of the following readings courses:		**1**

MATH 7921	Readings in Mathematics	
MATH 7922	Rdgs:Math Fndts-Cmptr Sc	
MATH 7923	Readings: Discrete Mathematics	
MATH 7924	Rdgs:Comp Mathematics	
MATH 7925	Readings: Optimization	
MATH 7926	Rdgs:Applied Prob/Stats	
MATH 7927	Rdgs:Comp/Math Biology	
Complete an additional 21 elective credit hours of graduate level coursework, in consultation with the program director.		**21**
The following courses will not count toward the Ph.D. in Applied Mathematics: MATH 5010, MATH 5012-5017, MATH 5198, MATH 5779 and MATH 5830.		
Complete 30 dissertation credit hours		**30**
MATH 8990	Doctoral Dissertation	
Total Hours		**70**

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