5 YEAR BS IN MATHEMATICS / MS IN APPLIED MATHEMATICS
Information and Plan of Study

Thank you for your interest in our 5 year degree program which leads to a BS in Mathematics and an MS in Applied Mathematics. Below you will find information on admissions, key policies and procedures, degree requirements, and an example plan of study. For more information, advising, or to express your interest in the program, please contact one of the Co-directors for the Graduate Program in the Department of Mathematical and Statistical Sciences: Michael Ferrara (Michael.Ferrara@ucdenver.edu) or Stephanie Santorico (Stephanie.Santorico@ucdenver.edu).

Admissions: Once a student has progressed beyond three semesters of calculus (through multivariate calculus), linear algebra, Introduction to Abstract Mathematics, and Real Analysis I, they may apply for entry into the 5 year BS in Mathematics / MS in Applied Mathematics degree program. A 3.0 grade point average (GPA) is required over all mathematics courses.

To apply, contact the one of the Co-directors for the Graduate Program in order to complete an "Intention to complete 4+1 Bachelor's to Master's Degree form."

Graduate School Policies and Procedures: The following excerpts are from Article II. Section 2.iv. of the Graduate School Policies and Procedures (as approved by Graduate Council April 3, 2013 and modified by Graduate Council February 2018). Students are not formally admitted to the Graduate School until they have earned their undergraduate degree. Students participating in a Bachelor's/Master's option must:

- fulfill all credit requirements of both the graduate and undergraduate programs
- petition to the Graduate Program* allowing this option before enrolling in any graduate level courses, and be advised by both undergraduate and graduate advisors; and
- apply and be admitted to the graduate program in the next regular semester (fall or spring) following the completion of the undergraduate degree.

* Here, the graduate program pertains to the Department of Mathematical and Statistical Sciences. Before enrolling in any graduate courses, the student must have been admitted into the 5 year degree program and submitted an "Intention to complete 4+1 Bachelor's to Master's Degree form."

The plan of study form follows along with one example plan.

Plan of Study for B.S. in Mathematics/M.S. in Applied Mathematics Date:_____

Prepared for: _____ Prepared by: _____

Expected Semester of BS Graduation: _____ Expected Semester of MS Graduation: _____

Course	*Semester*	*Grade*
CSCI 1410, 1411 Introduction to Programming		
Math 1401 Calculus I		
Math 2411 Calculus II		
Math 2421 Calculus III		
Math 3000 Introduction to Abstract Math		
Math 3191 Applied Linear Algebra		
Math 3382 Statistical Theory		
Math 4310 Introduction to Real Analysis I		
6 Additional Credits (typically 2 courses) above 3000 excluding 3040, 3511, 3800, 3999, 4012, 4013, 4014, 4830		
One of: • MATH 5070 Applied Analysis • MATH 6131 Real Analysis		
MATH 5718 Applied Linear Algebra		
MATH 5779 Math Clinic or MATH 6330 Workshop in Statistical Consulting		
At least three courses from: • MATH 5135 Functions of a Complex Variable • MATH 5310 Probability • MATH 5320 Introduction to Mathematical Statistics • MATH 5350 Mathematical Theory of Interest • MATH 5351 Actuarial Models • MATH 5410 Modern Cryptography • MATH 5432 Computational Graph Theory • MATH 5446 Automata Theory • MATH 5490 Network Flows • MATH 5593 Linear Programming • MATH 5610 Computational Biology • Any MATH course at the 6000 level or above • Note that MATH 6131 (Real Analysis) can be used to satisfy both the analysis core requirement and may also count as one of the three courses satisfying this requirement.		
12 hours of MATH courses numbered 5000 or above excluding MATH 5000-5010, MATH 5012-5015, MATH 5017, MATH 5198, MATH 5250 and MATH 5830.		

Additional notes for obtaining the B.S. in Mathematics:

- A C- or better is needed in each class counted towards your major and your grade point average must be at least 2.25 in these MATH classes. You must take at least 15 upper division (3000 or above) MATH credits (5 classes) at CU Denver.
- The semester you graduate, you must:
  - Complete the MFAT Exam and participate in an exit interview. These requirements will be scheduled through the department Administrative Assistant (303-315-1702).
  - Complete a senior survey.
- You must satisfy the requirements of the College of Liberal Arts and Sciences (CLAS). Contact CLAS advising office (303-556-2555) for details.
- To graduate as a Mathematics major, must have a minimum of 30 hours of resident credit (letter grades received at CU Denver). Furthermore, 21 out of the last 30 hours must be taken in CU Denver CLAS courses. Finally, at least 15 upper-division mathematics credits must be taken at CU Denver. For the most current CLAS residency requirements, please visit: http://www.ucdenver.edu/academics/colleges/CLAS/clas-advising
- Students with at least a 3.5 major grade point average, at least 3.2 overall grade point average, and who have done an honors project are eligible to graduate with honors. See an advisor (or the honors advising sheet) for details.

Additionally, students must satisfy the following requirements to obtain the M.S. in Applied Mathematics:

- At least 30 semester hours
- At least 24 hours must be in mathematics and statistics, numbered 5000 or above
- At most six hours may be in courses outside the Department of Mathematical & Statistical Sciences at the 4000 level or above, if approved by the student's academic advisor and by the Graduate Committee.
- The overall grade point average must be 3.0 or higher. Grades below a B- are not accepted (but they do contribute to the overall GPA).
- A maximum of 9 credit hours of coursework may be transferred into the M.S. program. Only courses completed with a grade of B- or better may be considered for transfer credit. 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 nondegree student are considered transfer courses.
- The following courses will **not** count toward a graduate degree in applied mathematics: MATH 5000-5010, MATH 5012-5015, MATH 5017, MATH 5198, MATH 5250 and MATH 5830.

Additional Notes:

- Students will be advised to take Introduction to Real Analysis II (MATH 4320) as an elective for the B.S.
- Students must complete either the requirements for the M.S. degree without concentration area or specific coursework requirements in one of the following areas: Applied Probability, Applied Statistics, Discrete Mathematics, Mathematics of Engineering and Science, Numerical Analysis, or Operations Research.

Example Plan of Study
BS in Mathematics / MS in Applied Mathematics

YEAR	FALL	SPRING	N1	N2	N3	N4
1	• MATH 1401: Calculus I • *[4 undergraduate non major courses]*	• MATH 2411: Calculus II • *[4 undergraduate non major courses]*	8	24	0	0
2	• MATH 2421: Calculus III • MATH 3191: Applied Linear Algebra • *[3 undergraduate non major courses]*	• MATH 3000: Introduction to Abstract Mathematics • MATH 3382: Statistical Theory • *[3 undergraduate non major courses]*	13	18	0	0
3	• 1 Undergrad MATH elective above 3000 excluding 3040, 3195, 3511, 3800, 4012-4015, 4830 • CSCI 1410/11: Introduction to Programming • MATH 4310: Introduction to Real Analysis 1 • *[2 undergraduate non major courses]*	• MATH 4320: Introduction to Real Analysis II • One graduate course in MATH prefix • *[3 undergraduate non major courses]*	13	15	3	0
	Following the Fall semester of year 3, contact the (Co-) Graduate Director to apply for entry into the 5 year BS/MS Program					
4	• *[2 undergraduate non major courses]* • MATH5718: Applied Linear Algebra • One graduate course in MATH prefix	• *[2 undergraduate non major courses]* • MATH 5070: Applied Analysis • MATH 5779: Math Clinic or MATH6330: Workshop in Statistical Consulting	0	12	12	12
5	• *[2 undergraduate non major courses]* • One graduate course in the MATH PREFIX One graduate course in the MATH PREFIX *GRADUATE FROM BS PROGRAM*	• One graduate course in the MATH PREFIX • One graduate course in the MATH PREFIX • One graduate course in the MATH PREFIX *MATRICULATE INTO MS PROGRAM and GRADUATE FROM MS PROGRAM*	0	6	15	0
		TOTALS =	34	75	30	12

N1 = number of undergraduate hours applying to major requirements
N2 = number of undergraduate non-major hours
N3 = number of graduate hours
N4 = number of graduate hours that apply to both the BS in Mathematics and the MS in Applied Mathematics