

MATHEMATICS - DATA SCIENCE OPTION, BS

Introduction

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

These degree requirements are subject to periodic revision by the academic department, and the College 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 major advisor and CLAS advisor to confirm the best plans of study before finalizing them.

Program Delivery

- This is an on-campus program.

Declaring This Major

- Click here (<http://catalog.ucdenver.edu/cu-denver/undergraduate/records-registration/registration/declare-change-major-minor/>) to go to information about declaring a major.

General Requirements

To earn a degree, students must satisfy all requirements in each of the three areas below, in addition to their individual major requirements.

- CU Denver General Graduation Requirements (<http://catalog.ucdenver.edu/cu-denver/undergraduate/graduation/general-graduation-requirements/>)
- CU Denver Core Curriculum (<http://catalog.ucdenver.edu/cu-denver/undergraduate/graduation-undergraduate-core-requirements/>)
- College of Liberal Arts & Sciences Graduation Requirements (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/#graduationrequirements>)
- Click here (<http://catalog.ucdenver.edu/cu-denver/undergraduate/academic-policies-procedures/>) for information about Academic Policies

Program Requirements

- Students must complete a total of 54 credit hours, including a minimum of 42 MATH credit hours and 9 credit hours in ancillary coursework.
- Students must complete at least 30 upper-division (3000-level and above) credit hours in the major.
- Students must earn a minimum grade of C- (1.7) in all major courses taken at CU Denver and must achieve a minimum cumulative major GPA of 2.25. All graded attempts in required and elective courses are calculated in the major GPA. Students cannot complete major or ancillary course requirements as pass/fail.
- Students must complete a minimum of 15 upper-division level MATH credit hours with CU Denver faculty.

Program Restrictions, Allowances and Recommendations

- Students may not use any of the following MATH courses to count toward major requirements:

- MATH 3195 Linear Algebra and Differential Equations
- MATH 3511 Mathematics of Chemistry
- MATH 3800 Probability and Statistics for Engineers
- MATH 4830 Applied Statistics

Programming Requirements

Code	Title	Hours
<i>Take one of the following programming requirements:</i>		3-4
MATH 1376	Programming for Data Science	3
Or		
CSCI 1410 & CSCI 1411	Fundamentals of Computing and Fundamentals of Computing Laboratory	4

Mathematics Courses

Code	Title	Hours
<i>Take all of the following Mathematics courses:</i>		33
MATH 1401	Calculus I	4
MATH 2411	Calculus II	4
MATH 2421	Calculus III	4
MATH 3000	Introduction to Abstract Mathematics	3
MATH 3191	Applied Linear Algebra	3
MATH 3376	Data Wrangling & Visualization	3
MATH 3382	Statistical Theory	3
MATH 4310	Introduction to Real Analysis I	3
MATH 4387	Applied Regression Analysis	3
MATH 4779	Math Clinic	3

Electives

Code	Title	Hours
<i>Take three approved MATH electives (at least nine semester hours) above the 3000 level, excluding 3195, 3511, 3800, and 4830.</i>		9
MATH 3200	Elementary Differential Equations	3
MATH 3301	Introduction to Optimization	3
MATH 3302	Simulation in Operations Research	3
MATH 3376	Data Wrangling & Visualization	3
MATH 3440	Introduction to Symbolic Logic	3
MATH 4010	History of Mathematics	3
MATH 4027	Topics in Mathematics	3
MATH 4110	Theory of Numbers	3
MATH 4140	Introduction to Modern Algebra	3
MATH 4310	Introduction to Real Analysis I	3
MATH 4320	Introduction to Real Analysis II	3
MATH 4337	Intro to Statistical and Machine Learning	3
MATH 4387	Applied Regression Analysis	3
MATH 4388	Machine Learning Methods	3
MATH 4390	Game Theory	3
MATH 4394	Experimental Designs	3

MATH 4408	Applied Graph Theory	3
MATH 4409	Applied Combinatorics	3
MATH 4450	Complex Variables	3
MATH 4650	Numerical Analysis I	3
MATH 4660	Numerical Analysis II	3
MATH 4791	Continuous Modeling	3
MATH 4792	Probabilistic Modeling	3
MATH 4793	Discrete Math Modeling	3
MATH 4794	Optimization Modeling	3
MATH 4810	Introduction to Probability	3

Additional Courses

Code	Title	Hours
	<i>Take three additional courses (typically 9 credits), countable towards a major in one of the following subjects, at any level:</i>	9

Business

- Accounting - BS in Business Administration with Specialization in Information Systems (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/business-school/business-administration/accounting-bs-business-administration-specialization-information-systems/>)
- Accounting, BS in Business Administration (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/business-school/business-administration/accounting-bs/>)
- Entrepreneurship, BS in Business Administration (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/business-school/business-administration/entrepreneurship-bs/>)
- Finance, BS in Business Administration (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/business-school/business-administration/finance-bs/>)
- Financial Management with Specialization in Information Systems, BS in Business Administration (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/business-school/business-administration/financial-management-specialization-information-systems-bs/>)
- Financial Management, BS in Business Administration (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/business-school/business-administration/financial-management-bs/>)
- Human Resources Management, BS in Business Administration (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/business-school/business-administration/human-resources-management-bs/>)
- Information Systems, BS in Business Administration (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/business-school/business-administration/information-systems-bs/>)
- International Business, BS in Business Administration (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/business-school/business-administration/international-business-bs/>)
- Management with Specialization in Information Systems, BS in Business Administration (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/business-school/business-administration/management-specialization-information-systems-bs/>)

business-administration/management-specialization-information-systems-bs/)

- Management, BS in Business Administration (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/business-school/business-administration/management-bs/>)
- Marketing with Specialization in Information Systems, BS in Business Administration (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/business-school/business-administration/marketing-specialization-information-systems-bs/>)
- Marketing, BS in Business Administration (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/business-school/business-administration/marketing-bs/>)
- Risk Management and Insurance, BS in Business Administration (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/business-school/business-administration/risk-management-insurance-bs/>)
- Sports Business, BS in Business Administration (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/business-school/business-administration/sports-business-bs/>)

Biology

- Biology, BS (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/integrative-biology/biology-bs/>)

Chemistry

- Chemistry, BS (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/chemistry/chemistry-bs/>)

Computer Science

- Computer Science, BA (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-engineering-design-computing/computer-science-engineering/computer-science-ba/>)
- Computer Science, BS (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-engineering-design-computing/computer-science-engineering/computer-science-bs/>)

Economics

- Economics, BA (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/economics/economics-ba/>)

Geography and Environmental Science

- Geography - Environment, Society and Sustainability Option, BA (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/geography-environmental-sciences/geography-environment-society-sustainability-option-ba/>)
- Geography - Environmental Science Option, BA (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/geography-environmental-sciences/geography-environmental-science-option-ba/>)

- Geography - Urban Studies and Planning, BA (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/geography-environmental-sciences/geography-urban-studies-planning-ba/>)
- Geography, BA (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/geography-environmental-sciences/geography-ba/>)

Health and Behavioral Science

- Public Health, BA (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/health-behavioral-sciences/public-health-ba/>)
- Public Health, BS (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/health-behavioral-sciences/public-health-bs/>)

Physics

- Physics - Pure and Applied Physics Option, BS (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/physics/physics-pure-applied-physics-option-bs/>)

Sociology

- Sociology - Gender and Society Concentration, BA (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/sociology/sociology-gender-society-concentration-ba/>)
- Sociology, BA (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/sociology/sociology-ba/>)

Other areas allowable on a case-by-case basis.

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

To review the Degree Map for this program, please visit our website (<https://www.ucdenver.edu/student/advising/undergraduate/degree-maps/clas/>).