Program Overview

Apart from the specialized mathematical skills that students acquire, the degree also reflects general skills that are valued by many employers. These skills include problem solving, critical thinking, analysis, facility with data, the ability to process quantitative information, and perhaps most important of all, the ability to learn new skills and concepts quickly.

The Probability and Statistics (STA) option provide training over three complementary and crucial facets of statistics: 1) the mathematical foundations of statistics, 2) classical and modern methods of statistical analysis, including data mining in the context of big data, and 3) consulting and analysis through the use of real data.

Academic Advising

The College of Liberal Arts and Sciences (CLAS) supports students to graduation using a dual-advising system. CLAS students have two academic advisors with whom they should meet regularly to discuss academic and degree progress: a CLAS Academic Advisor and a major/faculty advisor.

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| *For questions related to CU Denver Core Curriculum, CLAS, general graduation requirements, university/college academic policies, or campus resources contact:* | *For questions related to major requirements, major course prerequisites, or evaluation of transfer coursework in your major contact:* |
| CLAS Academic Advising  [clas\_advising@ucdenver.edu](mailto:clas_advising@ucdenver.edu)  Find your CLAS Advisor [here](http://www.ucdenver.edu/academics/colleges/CLAS/clas-advising/academicAdvising/Pages/CLASAdvisors.aspx)  North Classroom (NC) Building 1030  303-556-2555 | Henricus Bouwmeester  [henricus.bouwmeester@ucdenver.edu](mailto:henricus.bouwmeester@ucdenver.edu)  Visit the department website [here](http://www.ucdenver.edu/academics/colleges/CLAS/Departments/math/Pages/MathStats.aspx)  Student Commons Building (SCB) 4108  303-315-1737 |

General Graduation Requirements & Policies

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| *All CU Denver CLAS students are required to complete the following minimum general graduation requirements to be eligible to apply for graduation:* | *Credits exceeding the following maximum hour restrictions will not be applied toward the minimum 120 hours required for graduation:* |
| 1. Complete a minimum of 120 semester hours passed 2. Achieve a minimum 2.0 CU cumulative grade point average (GPA) 3. Complete a minimum of 45 upper-division (3000- to 4000-level) semester hours 4. Complete all college and major requirements 5. Residency: complete a minimum of 30 CLAS hours as a declared CLAS student at CU Denver 6. Terminal Residency: complete a minimum of 21 CLAS hours in the final 30 semester hours as a declared CLAS student at CU Denver | * 56 semester hours in major department/prefix courses * 16 semester hours Pass/Fail * 12 semester hours of Independent Study * 9 semester hours of internship credit * 8 semester hours of physical education credit |

Career Resources

The Mathematics (Probability and Statistics Option) B.S. degree prepares students for a wide range of career choices. With a mathematics degree, students gain the skills to do well in finance, statistics, engineering, computers, teaching, or accountancy. Mathematics students develop such skills as critical thinking, oral and written communication, arguing logically and rigorously, thinking abstractly, formulating and solving problems, analyzing data, analyzing mathematical models, quantitative and computer proficiency, and the ability to work both alone and in groups. Related occupations for Mathematics graduates include:

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| * Accountant | * Actuary | * Computer Programmer | * Demographer |
| * Economist | * Financial Planner | * Mathematician | * Nuclear Scientist |
| * Market Research Analyst | * Statistician | * Surveyor | * Treasurer |

Some careers and occupations require additional training or education. Interested in learning more about career and occupational options for this major? Visit the CU Denver Career Center located in the Tivoli Student Union (TV) Suite 267 to speak with a career counselor. The Career Center also provides *Career Briefs*, overviews of careers related to specific CU Denver majors, which include related links and resources to the particular field and show potential jobs related to the major. Access Career Briefs [here](http://www.ucdenver.edu/life/services/careercenter/Students/Pages/Career-Briefs.aspx).

Program Requirements & Policies

**Students are responsible for meeting with the major/faculty advisor in the department to confirm major requirements**. Students completing the Mathematics B.S. Degree are required to complete the following minimum program requirements:

1. Complete a total of at least 36 upper-division (3000- to 4000-level) MATH semester hours (typically 12 courses).
2. Complete at least 15 upper-division (3000- to 4000-level) semester hours in MATH in residence at CU Denver.
3. Achieve a grade of C- or better in all courses counted toward the MATH major.
4. Achieve a minimum GPA of 2.25 for all MATH courses applying to MATH requirements.

Program Requirements & Policies

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| **Courses** | **Credits** | **Notes** |
| **\* Course prerequisites change regularly. Students are responsible for consulting advisors and the class schedule in the student portal for prerequisite information.** **\*** | | |
| **Required Courses** | **42** |  |
| MATH1401 Calculus I | 4 | **\****Prerequisite: Placement* |
| MATH2411 Calculus II | 4 | **\****Prerequisite: C- or better in MATH1401* |
| MATH2421 Calculus III | 4 | **\****Prerequisite: C- or better in MATH2411* |
| MATH3000 Introduction to Abstract Mathematics | 3 | **\****Corequisite:* *MATH2421 or MATH3191* |
| MATH3191 Applied Linear Algebra | 3 | **\****Prerequisite: B- or better in MATH2411 (recommended)* |
| MATH4310 Introduction to Real Analysis | 3 | **\****Prerequisite: C- or better in MATH2421 and MATH3000* |
| MATH3200 Elementary Differential Equations | 3 | **\****Prerequisite: B- or better in MATH2411 (recommended)* |
| MATH4650 Numerical Analysis I | 3 | **\****Prerequisite: MATH2411* |
| MATH4779 Math Clinic | 3 | **\****Prerequisite: Consult MATH Advisor* |
| MATH4810 Probability | 3 | **\****Prerequisite: B- or better in MATH3191 (recommended)* |
| MATH4820 Introduction to Mathematical Statistics | 3 | **\****Prerequisite: C- or better in MATH 3800 or 4810 (preferred)* |
| MATH4387 Applied Regression Analysis **or** MATH4792 Probabilistic Modeling | 3 | **\****Prerequisite: C- or better MATH3191, 3800, or 4820 (for 4387) or B- or better in 4810 (for 4792) (recommended)* |
| **Choose ONE of the following Proof Based courses:** |  |  |
| MATH4110 Theory of Numbers **or** MATH4140 Into to Modern Algebra **or**   MATH4201 Topology **or** MATH4220 Higher Geometry II **or** MATH4320 Intro to   Real Analysis II **or** MATH4408 Applied Graph Theory | 3 | **\****Check Individual Courses for Prerequisites* |
| **Required Electives** | **6** |  |
| Choose **two** approved upper-division (3000- to 4000-level) mathematics  electives **excluding** MATH3040, 3511, 4012, 4013, 4014, and 4015 | 6 | **\****See Department for Approved List* |
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| **Total Program Hours** (excluding ACS Certified Degree Requirements)**:** | **48** | *36 semester hours must be upper-division* |

Sample Academic Plan of Study

The following academic plan is a *sample* pathway to completing degree requirements for this major. Students should tailor this plan based on previously completed college coursework (e.g., AP, IB, CLEP, dual/concurrent enrollment, and transfer credit), course availability, and individual preferences related to course load, schedules, or add-on programs such as minors or double-majors.

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| Year One | Milestones | Fall | CRS | Grade | √ | Spring | CRS | Grade | √ |
| * Meet your advisors * Introduce yourself to faculty in your department * Create an academic plan and check your Degree Audit with your advisors * Visit campus resources | ENGL1020 – Core Composition I | 3 |  |  | ENGL2030 – Core Composition II | 3 |  |  |
| MATH1401 | 4 |  |  | MATH2411 | 4 |  |  |
| CU Core Social Science | 3 |  |  | CU Core Behavioral Science | 3 |  |  |
| CU Core Arts | 3 |  |  | CU Core Biol/Phys Science with Lab | 4 |  |  |
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| Year Two | Milestones | Fall | CRS | Grade | √ | Spring | CRS | Grade | √ |
| * Meet with your advisors to complete a 60-hour check * Join a student club or organization * Begin to research internships * Visit the Career Center * Explore additional major(s) or minors | MATH2421 | 4 |  |  | MATH3191 | 3 |  |  |
| MATH3000 | 3 |  |  | MATH3200 | 3 |  |  |
| CLAS Biol/Phys Science with Lab | 4 |  |  | CLAS Communicative Skills | 3 |  |  |
| CU Core Humanities | 3 |  |  | CU Core Cultural Diversity | 3 |  |  |
|  |  |  |  | General Elective | 3 |  |  |

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| Year Three | Milestones | Fall | CRS | Grade | √ | Spring | CRS | Grade | √ |
| * Explore research opportunities in your major * Apply for internships * Begin to research professional or graduate programs | MATH4310 | 3 |  |  | MATH4810 | 3 |  |  |
| MATH4650 | 3 |  |  | MATH Proof Based Course | 3 |  |  |
| CLAS Foreign Language Semester I | 5 |  |  | CLAS Foreign Language Semester II | 5 |  |  |
| CU Core International Perspectives | 3 |  |  | CLAS Humanities | 3 |  |  |
| General Elective | 3 |  |  | General Elective | 3 |  |  |

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| Year Four | Milestones | Fall | CRS | Grade | √ | Spring | CRS | Grade | √ |
| * See advisors for a grad check the semester before you plan to graduate * Explore independent studies in your major * Submit professional or graduate program applications * Apply for graduation | MATH4820 | 3 |  |  | MATH4779 | 3 |  |  |
| Upper-Division MATH Elective | 3 |  |  | MATH4387 or MATH4792 | 3 |  |  |
| Upper-Division MATH Elective | 3 |  |  | CLAS Social Science | 3 |  |  |
| CLAS Behavioral Science | 3 |  |  | Upper-Division General Elective | 3 |  |  |
| Upper-Division General Elective | 3 |  |  | General Elective | 3 |  |  |

M *Major Course Available* PE *Prerequisite Enforced* PR *Prerequisite Recommended*