

MATH FOR DATA SCIENCE

SPS Certificate website: <https://sps.northwestern.edu/post-baccalaureate/math-data-science/>

For students and professionals seeking to build math and analysis proficiency, the Math for Data Science post-baccalaureate certificate program is designed to strengthen their quantitative background for graduate school or to enhance their data analysis skills for their careers. Consisting of courses in applied mathematics, statistics, and calculus, the program provides students with a quantitative foundation for data analysis—a critical skillset that is applicable to a wide range of industries.

Certificate Offered

- Math for Data Science, Certificate (<https://catalogs.northwestern.edu/sps/certificates/post-baccalaureate/math-data-science/math-data-science-certificate/>)

Math for Data Science Courses

MATH 202-CN Finite Mathematics (1 Unit)

Foundation of mathematical knowledge targeting data analysis. Topics chosen from set theory, combinatorics (the art of counting), finite probability, elementary linear algebra and its applications to linear optimization problems.

MATH 220-A Single-Variable Differential Calculus (1 Unit)

Limits. Differentiation. Linear approximation and related rates. Extreme value theorem, mean value theorem, and curve-sketching. Optimization.

MATH 220-A-DL Single-Variable Differential Calculus (1 Unit)

Limits, Differentiation. Linear approximation and related rates. Extreme value theorem, mean value theorem, and curve-sketching. Optimization.

MATH 220-B Single-Variable Integral Calculus (1 Unit)

Definite integrals, antiderivatives, and the fundamental theorem of calculus. Transcendental and inverse functions. Areas and volumes. Techniques of integration, numerical integration, and improper integrals. First-order linear and separable ordinary differential equations.

Prerequisite: MATH 220-A.

MATH 220-B-DL Single-Variable Integral Calculus (1 Unit)

Definite integrals, antiderivatives, and the fundamental theorem of calculus. Transcendental and inverse functions. Areas and volumes. Techniques of integration, numerical integration, and improper integrals. First-order linear and separable ordinary differential equations.

Prerequisite: MATH 220-A, MATH 220-A-DL.

MATH 240-CN Linear Algebra (1 Unit)

Elementary linear algebra: systems of linear equations, matrix algebra, subspaces, determinants, eigenvalues, eigenvectors, and orthogonality.

Prerequisite: MATH 230-A or equivalent.

STAT 202-DL Introduction to Statistics and Data Science (1 Unit)

This course provides an introduction to the basic concepts of statistics. Throughout the course, students will learn to: summarize data using graphs and tables; explain/calculate descriptive statistics, confidence intervals, correlation, regression, and probability; and explain tests of significance and data-production including sampling and experiments. Basic knowledge of algebra is recommended.