MATHEMATICAL SCIENCES (MTHS)

The courses listed on this page are exclusive to the LPS BAAS degree (https://lpsonline.sas.upenn.edu/features/what-bachelor-applied-arts-and-sciences-degree/) and LPS Online certificates (https://lpsonline.sas.upenn.edu/academics/certificates/).

MTHS 1000 Mathematical Foundations for Data Analytics
This course provides an introduction to key topics that form the foundation for further study in mathematics, data analytics, and statistics. Topics covered include finite math, logic, algebra (including basics of matrix algebra) functions, probability, and a conceptual introduction to calculus. Through this course, students will develop both an understanding of the concept the ability to apply the concepts and techniques to analysis and problem-solving. Course format includes readings, lectures and demonstrations, and extensive hands-on practice with instructor and peer feedback.
1 Course Unit

MTHS 1010 Maths All Around
1 Course Unit

MTHS 2000 Mathematics All Around You
This course covers topics in logic, sets, probability, history and philosophy of mathematics, graph theory, game theory, geometry, and their relevance to contemporary science and society. Students can register for MTHS 2000 without completing MTHS 1000.
1 Course Unit

MTHS 2200 Introduction to Applied Statistics
In this introductory statistics course students will be familiarized with the fundamental techniques for using sample data to make inferences about populations. We will begin with developing the necessary probability framework and statistical intuition before moving to the specific procedures for statistical inferences from large and small samples, single and multiple linear regressions, and measuring correlation. We will examine real-world examples that illustrate the concepts and help students see how they apply to life and work situations.
1 Course Unit

MTHS 3000 Linear Algebra
Understanding concepts from Linear Algebra is essential to serious study of many disciplines, ranging from physics and chemistry to economics and computer and data science, not to mention further study of higher mathematics. In this course, we'll be looking at both computational and theoretical aspects of linear algebra, as well as at a number of applications. The "basic stuff" of linear algebra comprises vector spaces and the linear mappings between them. These mappings are represented by matrices, and a lot of linear algebra is concerned with reducing the enormous amount of data contained in a matrix to a few salient numbers and properties. There aren't many prerequisites for the course other than basic high-school algebra and a willingness to stretch your mind around some awesome abstract concepts -- higher (than 3)-dimensional spaces, deducing things abstractly from basic principles, and learning how to interpret and exploit the deductions. It will be an exciting and fast-paced journey through topics such as Gaussian elimination, linear systems, linear transformations and their matrix representations, eigenvalues and eigenvectors, the singular-value decomposition and principal component analysis.
Fall or Spring
1 Course Unit