Math 203: Linear Algebra
Prof. Djordje Milićević
Spring 2021

Section 1: MTh 9:40-11AM
Section 2: MTh 1:10-2:30PM

Mode of delivery: Hybrid
• There will usually be shorter prerecorded lectures, available asynchronously, which students will first watch in advance of class meetings.
• Class meetings (in-person or via Zoom) will comprise of a combination of further in-depth discussion and examples worked out in detail, group work, and student-led, office hour-style Q&A conversation and problem solving, combined flexibly according to learning needs and students’ preferences.

You already know how to solve equations such as $3x = 5$. Such equations can have more variables, like $2x + 3y + 5z = 7$, and are called linear as they may be thought of as describing lines, planes and other flat spaces, their intersections, and so on.

Linear Algebra is concerned with phenomena that can be fruitfully studied via systems of linear equations, which will in turn lead us to matrices and linear transformations that represent them, vectors, linear independence and bases, determinants, eigenvectors, and orthogonality. Starting from concrete examples, we will discover powerful, universal algorithms (procedures) that allow you to fully and confidently analyze any system of linear equations, diagonalize any matrix, describe any linear transformation, as well as a rich, beautiful theory that ties it all together.

Just how interesting is this? Linear Algebra underlies how Google’s page ranking works. Also, recommendation algorithms at Spotify and Netflix. Also, the spread of diseases in epidemiology. Regression analysis in all of social sciences. Modeling entire economies. Data fitting. Picture compression that allows you to store thousands of videos without thinking about space. In the second half of the course, we will also talk about most of these applications, and once you understand Linear Algebra and its algorithms well, you will be equipped to understand all of them.

Linear Algebra also underpins all of mathematics: algebra, analysis, geometry, applied math, not to mention quantum mechanics, electrical engineering, statistics, economics, Big Data analytics, and lots and lots of science. Take it!

Pre-requisites: Math 102, or permission of instructor.