

Mathematical Computing

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Prerequisites: MATH 223 and MATH 313

This course is an introduction to using computers to understand mathematical concepts and solve problems in the mathematical sciences. Fundamental concepts of MATLAB programming (including flow control, primitive data structures, recursion and graphics) are applied to concepts and problems in applied mathematics, probability, geometry, and discrete mathematics.

Given written or oral descriptions of algorithms that solve representative problems in the mathematical sciences, students will be able to implement those algorithms in MATLAB. Also, given descriptions of representative problems in the mathematical sciences, students will be able to construct and implement algorithms in MATLAB for solving those problems.

Students will learn the basic syntax of MATLAB; students will know how to plot in two and three dimensions, construct and manipulate common objects (such as values, arrays, and strings), and write functions and scripts.

Text: "Insight Through Computing: A MATLAB Introduction to Computational Science and Engineering" by Charles F. Van Loan and K.-Y. Daisy Fan. I hope to cover Chapters 1-12, and if time permits, chapter 15.