

# MATH B301: REAL ANALYSIS I

## FALL 2021

Prerequisite: MATH B201 (Multivariable Calculus)

*Note: This is a WA (Writing Attentive) course for the math major.*

Analysis is the branch of mathematics that deals with inequalities and limiting processes. This is a first course in real analysis, providing a rigorous development of single variable calculus, with a strong focus on proof writing. In this course we shall study the theory of calculus, material that you may have seen in Math B101 (Calculus I), Math B102 (Calculus II), and Math B201. In those courses, the focus was on how to do various types of problems. In this course, the focus will be on understanding the underlying ideas of calculus using formal mathematical reasoning. We will start from the completeness of the real line, the distinguishing characteristic of analysis among other mathematical disciplines, and then we will continue with sequences, limits, topological properties of the real line (e.g. open sets, closed sets, limit points, closures, complements), and continuity.

Goals of the course include:

- To learn to communicate mathematical reasoning in writing and verbally, both via informal arguments and via more formal proofs;
- To understand and be able to use the fundamental theorems of real analysis.