

## The Department of Mathematics

2022–23–A term

**Course Name** Infinitesimal Calculus 1

**Course Number** 201.1.1011

**Course web page**

<https://www.math.bgu.ac.il/en/teaching/fall2023/courses/infi1>

**Lecturer** Prof. Ilan Hirshberg, <ilan@bgu.ac.il>, Office 203

**Office Hours** <https://www.math.bgu.ac.il/en/teaching/hours>

### Abstract

### Requirements and grading<sup>1</sup>

### Course topics

Axioms of the reals. Sequences: limits, monotone sequences, the Bolzano-Weierstrass theorem, Cauchy's criterion, the number  $e$ . Limits of functions. Continuous functions: equivalent definitions of continuity, properties of the elementary functions, the exponential function, the Intermediate Value Theorem, existence of extrema in closed and bounded sets, uniform continuity and Cantor's theorem. Introduction to derivatives: the definition of the derivative and differentiation rules, the derivative of an inverse function, derivatives of elementary functions, Fermat's theorem, Rolle's theorem and Lagrange's Mean Value Theorem.

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<sup>1</sup>Information may change during the first two weeks of the term. Please consult the webpage for updates