אוניברסיטת
בן-גוריון בנגב

# The Department of Mathematics

2018–19–A term

**Course Name** Infinitesimal Calculus 3

**Course Number** 201.1.0031

**Course web page**
`https://www.math.bgu.ac.il//en/teaching/fall2019/courses/infinitesimal-calculus-`

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

## Abstract

## Requirements and grading[1]

## Course topics

- Basic concepts of topology of metric spaces: open and closed sets, connectedness, compactness, completeness.
- Normed spaces and inner product spaces. All norms on $\mathbb{R}^n$ are equivalent.
- Theorem on existence of a unique fixed point for a contraction mapping on a complete metric space.
- Dffierentiability of a map between Euclidean spaces. Partial derivatives. Gradient. Chain rule. Multivariable Taylor expansion.
- Open mapping theorem and implicit function theorem. Lagrange multipliers. Maxima and minima problems.
- Riemann integral. Subsets of zero measure and the Lebesgue integrability criterion. Jordan content.
- Fubini theorem. Jacobian and the change of variables formula.
- Path integrals. Closed and exact forms. Green's theorem.
- Time permitting, surface integrals, Stokes's theorem, Gauss' theorem

[1] Information may change during the first two weeks of the term. Please consult the webpage for updates