

The Department of Mathematics

2019–20–A term

Course Name Calculus B2

Course Number 201.1.9151

Course web page

<https://www.math.bgu.ac.il/en/teaching/fall2020/courses/calculus-b2>

Lecturer Dr. Natalia Karpivnik, <mordeev@post.bgu.ac.il>, Office 10

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

Abstract

Requirements and grading¹

Course topics

1. Infinite series. Tests for convergence. Taylor series and Taylor polynomials. Absolute convergence. Alternating series. Conditional convergence. Power series for functions. Convergence of power series; differentiation and integration.
2. Vectors and parametric equations. Parametric equation in analytic geometry. Space coordinates. Vectors in space. The scalar product of two vectors. The vector product of two vectors in space. Equations of lines and planes. product of three vectors and more. Catalog of the quadratic surfaces. Cylinders.
3. Vector functions and their derivatives. Vector functions. differentiation formulas. Velocity and acceleration. Tangential vectors. Curvature and normal vectors. Polar coordinates.
4. Partial differentiation. Functions of two and more variables. The directional derivative. limits and continuity. Tangent plane and normal lines. The gradient. The chain rule for partial derivatives. The total differentiation. Maxima and minima of functions of several independent variables. Higher order derivatives.

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



5. Multiple integrals. Double integrals. Area and volume by double integrals. Double integrals in polar coordinates. Physical applications. triple integrals. Integration in cylindrical and spherical coordinates. Surface area. Change of variable in multiple integrals.
6. Vector analysis. Vector fields. Line integrals. Independence of path. Green's theorem. Surface integrals. The divergence theorem. Stokes' theorem.