

The Department of Mathematics

2021–22–B term

Course Name Differential and Integral Calculus ME2

Course Number 201.1.9721

Course web page

<https://math.bgu.ac.il/en/teaching/spring2022/courses/differential-and-integral>

Lecturer Prof. Dmitry Kerner, <kernerdm@bgu.ac.il>, Office 217

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

Abstract

Requirements and grading¹

Course topics

- .1 Infinite series of nonnegative terms and general series. Absolute and conditional convergence. Power series.
- .2 Vector algebra. Dot product, cross product and box product.
- .3 Analytic geometry of a line and a plane. Parametric equations for a line. Canonic equations for a plane. Points, lines and planes in space.
- .4 Vector-valued functions. Derivative. Parametrized curves. Tangent lines. Velocity and acceleration. Integration of the equation of motion.
- .5 Surfaces in space. Quadric rotation surfaces. Cylindrical and spherical coordinates.
- .6 Scalar functions of several variables. Scalar field. Level surfaces. Limit and continuity. Partial derivatives. Directional derivative. Gradient vector. Differential. Tangent plane and normal line. Chain rules. Implicit function and its derivative. Taylor and MacLaurin formulas. Local extreme values. Absolute maxima and minima on closed bounded regions.

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



- .7 Vector-valued functions of several variables. Vector field. Field curves. Divergence and curl.
- .8 Line and path integrals. Work, circulation. Conservative fields. Potential function.
- .9 Double integral and its applications. Green's theorem.
- .10 Parametrized surfaces. Tangent plane and normal line. Surface integrals. Flux. Stokes's theorem.
- .11 Triple integral and its applications. Divergence theorem.