אוניברסיטת
בן-גוריון בנגב

# The Department of Mathematics

2017–18–A term

**Course Name** Calculus B1

**Course Number** 201.1.9141

**Course web page**
`https://math.bgu.ac.il//en/teaching/fall2017/courses/calculus-b1`

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

## Abstract

## Requirements and grading[1]

## Course topics

.1 Introduction to number theory. Intervals and segments. Concept of a function. Elementary functions. .2 Limit of a function.3. Continuity and discontinuity of functions.4. Derivative and dffierential. Basic derivatives. Dffierentiability and continuity. Linear approximation by dffierentials. High-order derivatives. The fundamental theorems of dffierentiation and their applications. L'Hopital's theorem and its application to calculation of limits.5. Taylor's polynom. Expansion of functions into Taylor's and McLoran's series. Expansions of some usage functions. Application of Taylor's and McLoran's polynoms a) to approximate calculations, and b) to calculation of limits.6. Investigation of a function. Extremal points. Necessary and sufficient conditions for extrema. Max. and min. of a function within a segment. Convexity and concavity, inflection point. Asymptotes. Graph construction.7. Primitive function and indefinite integral. Table integrals. Calculation of indefinite integrals by decomposition, by parts, by substitution. Integration of rational and trigonometric functions.8. Definite integrals. Reimann's sum. The fundamental theorem. Formula of Newton-Leibnitz. Calculation of definite integrals. Integration by decomposition, by parts, by substitution.9. Use in definite integrals to calculation of areas, volumes and curve lengthes. Rectungular and polar coordinate systems.10.

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


First-order ordinary dffierential equations. General definitions. Cauchy problem. Separated variables.