

## The Department of Mathematics

2021–22–B term

**Course Name** Calculus 1 for engineering

**Course Number** 201.1.9711

**Course web page**

<https://www.math.bgu.ac.il/en/teaching/spring2022/courses/differential-and-integral-calculus-me1>

**Lecturer** Dr. Natalia Gulko, <gulko@post.bgu.ac.il>, Office מינוס 108

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

### Abstract

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

### Course topics

In this course the basic concepts of one-dimensional analysis (a limit, a derivative, an integral) are introduced and explored in different applications: graphing functions, approximations, calculating areas etc.

- .1 Limit of a function, continuity.
- .2 Derivative, basic derivative formulas.
- .3 Derivative of an inverse function; derivative of a composite function, the chain rule; derivative of an implicit function.
- .4 Derivatives of high order.
- .5 The mean value problem theorem. Indeterminate forms and l'Hopital's rule.
- .6 Rise and fall of a function; local minimal and maximal values of a function.
- .7 Concavity and points of inflection. Asymptotes. Graphing functions.

---

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



- .8 Linear approximations and differentials. Taylor's theorem and approximations of an arbitrary order.
- .9 Indefinite integrals: definition and properties.
- .10 Integration methods: the substitution method, integration by parts.
- .11 Definite integrals. The fundamental theorem of integral calculus (Newton-Leibniz's theorem).
- .12 Calculating areas.

**Bibliography** Thomas & Finney, *Calculus and Analytic Geometry*, 8th Edition, Addison-Wesley (World Student Series).