



## The Department of Mathematics

2022–23–B term

**Course Name** Integral Calculus and Ordinary Differential Equations for EE

**Course Number** 201.1.9681

**Course web page**

<https://www.math.bgu.ac.il/en/teaching/spring2023/courses/integral-calculus-and-ordinary-differential-equations-for-ee>

**Lecturer** Dr. Dennis Gulko, <gulkod@post.bgu.ac.il>, Office

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

### Abstract

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

### Course topics

- .1 The Riemann integral: Riemann sums, the fundamental theorem of calculus and the indefinite integral. Methods for computing integrals: integration by parts, substitution, partial fractions. Improper integrals and application to series.
- .2 Uniform and pointwise convergence. Cauchy criterion and the Weierstrass M-test. Power series. Taylor series.
- .3 First order ODE's: initial value problem, local uniqueness and existence theorem. Explicit solutions: linear, separable and homogeneous equations, Bernoulli equations.
- .4 Systems of ODE's. Uniqueness and existence (without proof). Homogeneous systems of linear ODE's with constant coefficients.
- .5 Higher order ODE's: uniqueness and existence theorem (without proof), basic theory. The method of undetermined coefficients for inhomogeneous second order linear equations with constant coefficients. The harmonic oscillator and/or RLC circuits. If time permits: variation of parameters, Wronskian theory.

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