

The Department of Mathematics

Summer 2021

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/summer-2021/courses/integral-calculus-and-ordinary-differential-equations-for-ee>

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

Abstract

Requirements and grading¹

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.

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