

The Department of Mathematics

2023-24-B term

Course Name Approximation Theory

Course Number 201.1.0121

Course web page https://www.math.bgu.ac.il//en/teaching/spring2024/courses/ approximation-theory

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

Abstract

Requirements and grading¹

Course topics

- .1 Preliminaries: floating point arithmetic, round-off errors and stability. Matrix norms and the condition number of a matrix.
- .2 Introduction to numerical solutions for ODE's:initial value problems, Euler's method, introduction to multistep methods. Boundary value problems.
- .3 Numerical solution of linear equations: Gauss elimination with pivoting, LU decomposition. Iterative techniques: Jacobi, Gauss-Seidel, conjugate gradient. Least squares approximation.
- .4 Numerical methods for finding eigenvalues: Gershgorin circles. The power method. Stability considerations in Gram-Schmidt: Hausholder reflections and Givens rotations. Hessenberg and tridiagonal forms. QR decomposition and the QR algorithm.

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