

The Department of Mathematics

2023–24–B term

Course Name Algebra 1 for CS

Course Number 201.1.7011

Course web page

<https://math.bgu.ac.il/en/teaching/spring2024/courses/algebra-1-cs>

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

Abstract

Requirements and grading¹

Course topics

- 1 General background: sets and operations on them, Complex numbers: definition (via ordered pairs), addition and multiplication, inverses, adjoint, absolute value. Real and complex polynomials and their roots.
- 2 Fields: Definition, properties, examples: Rationals, reals, complex numbers, integers mod p .
- 3 Linear equations over fields, matrices and elementary row operations, rank of a matrix, solutions of homogeneous and non homogeneous systems of linear equations and the connections between them.
- 4 Vector spaces over fields, subspaces, bases and dimensions, coordinates change of coordinate matrix, row rank as rank of a subspace, sums, direct sums of subspaces and the dimension theorem.
- 5 Matrices multiplication, the algebra of square matrices, inverse determinants: properties, Cramer's rule, adjoint and its use for finding the inverse.
- 6 Linear transformations basic properties kernel and image of a linear transformation representation of linear transformations by matrices and the effect of change of bases. linear functionals, dual bases

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