The Department of Mathematics  
2019–20–B term

Course Name  Coding Theory
Course Number  201.1.4501
Lecturer  Prof. Ido Efrat, <efrat@bgu.ac.il>, Office 106
Office Hours  https://www.math.bgu.ac.il/en/teaching/hours

Abstract

Requirements and grading

Course topics

Coding Theory investigates error-detection and error-correction. Such errors can occur in various communication channels: satellite communication, cellular telephones, CDs and DVDs, barcode reading at the supermarket, etc. A mathematical analysis of the notions of error detection and correction leads to deep combinatorial problems, which can be sometimes solved using techniques ranging from linear algebra and ring theory to algebraic geometry and number theory. These techniques are in fact used in the above-mentioned communication technologies.

Topics

1. The main problem of Coding Theory

2. Bounds on codes

Information may change during the first two weeks of the term. Please consult the webpage for updates.
3. Finite fields
4. Linear codes
5. Perfect codes
6. Cyclic codes
7. Sphere packing
8. Asymptotic bounds