אוניברסיטת
בן-גוריון בנגב

The Department of Mathematics

2018–19–B term

Course Name Fourier Analysis

Course Number 201.1.0231

Course web page
`https://www.math.bgu.ac.il//en/teaching/spring2019/courses/fourier-analysis`

Lecturer Prof. Eitan Sayag, <sayage@bgu.ac.il>, Office 107

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

Abstract

Requirements and grading[1]

Course topics

- Cesaro means: Convolutions, positive summability kernels and Fejer's theorem.
- Applications of Fejer's theorem: the Weierstrass approximation theorem for polynomials, Weyl's equidistribution theorem, construction of a nowhere dffierentiable function (time permitting).
- Pointwise and unfiorm convergence and divergence of partial sums: the Dirichlet kernel and its properties, construction of a continuous function with divergent Fourier series, the Dini test.
- L^2 approximations. Parseval's formula. Absolute convergence of Fourier series of C^1 functions. Time permitting, the isoperimetric problem or other applications.
- Applications to partial dffierential equations. The heat and wave equation on the circle and on the interval. The Poisson kernel and the Laplace equation on the disk.

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

- Fourier series of linear functionals on $C^n(\mathbb{T})$. The notion of a distribution on the circle.
- Time permitting: positive definite sequences and Herglotz's theorem.
- The Fourier transform: convolutions, the inversion formula, Plancherel's theorem, Hermite functions. Time permitting: tempered distributions, further applications to dffierential equations.
- Fourier analysis on finite cyclic groups, and the Fast Fourier Transform algorithm.