

The Department of Mathematics

2020–21–B term

Course Name Stationary Dynamics and Random Walks on Groups

Course Number 201.2.5461

Course web page

<https://math.bgu.ac.il/en/teaching/spring2021/courses/random-walks-on-groups>

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

Abstract

Requirements and grading¹

Course topics

The general question that leads the course is: what can we deduce about a group when studying random walks on it.

Stationary dynamics is a branch of Ergodic theory that focuses on measurable group actions arising from random walks. The main object studied is the Furstenberg-Poisson boundary.

Applications of the theory can be found in rigidity theory, and recently connections with operator theory have been established

Topics:

- Brief introduction to Ergodic theory: Borel spaces, factors, compact models. Probability measure preserving actions and measure class preserving actions. Stationary measures.
- Random Walks: Markov chains, Martingale convergence theorem, Random walks on groups, Furstenberg-Poisson boundary. Choquet-Deny theorem, amenable groups. Entropy. Realization of the Furstenberg Poisson boundary.

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



- Applications to Rigidity: Margulis' Normal Subgroup Theorem, and Bader-Shalom's theorem (IRS rigidity).