

MATH 542 - TOPICS IN ERGODIC THEORY

Instructor: Akos Magyar

Time and location: Tue - Thu, 11-12:30, MATX 1118

The course will give an introduction to some notions, techniques and results in ergodic theory of current interests. Particular emphasis will be given to results on multiple recurrence. Topics include

- Topological dynamics and applications to Ramsey and number theory
- The mean and pointwise ergodic theorems
- Single recurrence: theorems of Khinchin and Sárközy-Furstenberg
- Multiple recurrence: compact and weak mixing systems
- Factors and characteristic factors
- Compact and weak mixing extensions
- Furstenberg's multiple recurrence theorem and Szemerédi's theorem
- Nilsystems and limits of multiple averages

Textbook: There is no textbook for the course however most of the material is found in:
H. Furstenberg: *Recurrence in ergodic theory and combinatorial number theory*. I will also upload supplemental notes and links on the course page.

Webpage: TBA

Prerequisite: Basic level knowledge of functional analysis and measure theory is helpful.