

$$\frac{1}{N} \sum_{n=1}^N f(T^n x) \xrightarrow{N \rightarrow \infty} \int f d\mu, \text{ a.e. } x \in X$$

Ergodic Theory

Math 7352 Fall 2019

MW 2:20 - 3:45 pm, Dunn Hall 203

Instructor Dr. James T. Campbell

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Office Hours MWF 10:15 - 11:15 am. Appointments may be made as needed.

Topics

Ergodic Theory is a vast subject that originated in mathematical physics, and has since contributed to a diverse array of fields such as information theory, combinatorics, number theory, and others. Our emphasis will be on (i) understanding the basics results in the field, and (ii) oscillation and variation results and their interaction with analysis (e.g., oscillation for the Hilbert transform), and (iii) exploring the contributions of ergodic theory, especially recurrence-type results, to additive combinatorics. In terms of the book, we will be discussing Chapters 2, 4, and 7, plus a smattering of others. Individual research papers will also be presented.

Student Requirements

Pre-requisite: Math 7350

Text: *Ergodic Theory with a view towards Number Theory*, by Ward and Einsiedler (Springer, GTM 259)

Exams: None.

Homework: Homework assignments (3 problems each) will be due every two weeks.

Presentation: Students will select a research paper to present to the class at the end of the term (in lieu of a final exam). Dr. C will assist with the selection of a proper paper, if the student so desires.