



Catalog Description:

Theoretical treatment of probability, with applications within and outside mathematics.

Prerequisite:

C or better in 5529H, or permission of department.

Purpose of Course:

The acquaintance with rigorous probability theory, its history and its multiple connections, will better prepare honor students for graduate studies and will help them get involved in research at earlier stages of their careers.

Text:

Vary, for example:

- *Heads and Tails. An Introduction to Limit Theorems in Probability*, E. Lesigne, AMS, ISBN 0821837141
- *Elementary Probability Theory with Stochastic Processes*, Kai Lai Chung
- *Elementary Probability Theory*, Kai Lai Chung and Farid AitSahlia,, 4th Edition, Springer, 2003

Topics List:

1. Historical origins of probability.
2. Diverse ways of sampling, allocation, models.
3. Random variables, expectation, moments.
4. Important distributions.
5. Limit theorems: law of large numbers, central limit theorem.
6. Random walks and Markov chains.
7. Statistical independence in analysis and number theory.