Random Polynomials

MATH 6010-351

Time and Place: T Th 12:00-1:15 p.m. in MSCS 428
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Textbooks: 1. V. V. Prasolov, Polynomials, Springer, 2004; 2. J. Jacod and P. Protter, Probability Essentials, Springer, 2000.

This is a continuation of the summer course on random polynomials and matrices. We shall cover more advanced topics in probability such as weak convergence of measures, characteristic functions, the Laws of Large Numbers, the Central Limit Theorem, as well as their applications to the distribution of zeros of random polynomials. We also plan to consider some topics in the asymptotic distribution of eigenvalues of random matrices and related problems in orthogonal polynomials and potential theory.

We shall discuss many open research problems in this rapidly developing area. Every student will be required to work on a project and give a presentation.

Additional references:
1. A. T. Bharucha-Reid and M. Sambandham, Random polynomials, Academic Press, Orlando, 1986.
2. P. B. Borwein and T. Erdelyi, Polynomials and Polynomial Inequalities, Springer, 1995.
3. P. Deift, Orthogonal Polynomials and Random Matrices: A Riemann-Hilbert Approach, American Mathematical Society, 2000.
4. K. Farahmand, Topics in random polynomials, Pitman Res. Notes Math. 393 (1998).
5. Q. I. Rahman and G. Schmeisser, Analytic Theory of Polynomials: Critical Points, Zeros and Extremal Properties, Oxford University Press, 2002.