

FALL 2020, Math 531 : Analytic Theory of Numbers I

Instructor: Alexandru Zaharescu

E-mail: zaharesc@illinois.edu

Lectures: TR 9:30-10:50am

Office Hours: Tuesdays 11:50 AM - 12:30 PM and Thursdays 1:50 PM - 3 PM

Course Description. We will follow closely Professor Hildebrand's lecture notes. Topics will include:

- (1) Arithmetic functions.
- (2) Elementary theorems on the distribution of primes.
- (3) Dirichlet series and Euler products.
- (4) Properties of the Riemann zeta function.
- (5) Analytic proof of the Prime Number Theorem.
- (6) Dirichlet's theorem on primes in arithmetic progressions.

Prerequisite: MATH 448 and either MATH 417 or MATH 453.

Grading Policy: Comprehensive final exam: 35%; Two midterm exams: $2 \times 25=50\%$; Homework: 15%.

Final Exam: The final exam will be given on Friday, December 18, 1:30-4:30 PM.

Recommended Textbooks:

Main reference: A. J. Hildebrand, Introduction to Analytic Number Theory, available on Professor Hildebrand's webpage.

Additional reference: T. M. Apostol, Introduction to Analytic Number Theory, Springer-Verlag, 1st ed. 1976.