Math 571 Analytic Number Theory II Fall 2018, Syllabus

Class #:26447   Class ID:029708
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Office Hours: MWR 2:30-3:30 and otherwise by arrangement.
Class: TR 12:05-1:20 Room ?

There is no set text but the following give useful background:


Homework: Due every Tuesday.
Grading: Based on Homework and Attendance.

Topics

There have been several recent sensational developments in analytic number theory.

1. Zhang, Maynard and Tao, following Goldston, Pintz and Yildirim showed that there are bounded gaps between primes.
2. Green and Tao have shown that there are arbitrarily long arithmetic progressions in the primes.
3. Helfgott has shown that every odd $n > 5$ is the sum of three prime numbers.
4. Maromäki and Radziwiłl have proved interesting new results about multiplicative function.
5. There have been several breakthroughs on the Vinogradov Mean Value Theorem by Wooley, Bourgain and others.

We will cover the large sieve, the Selberg sieve and Bombieri’s theorem on primes in arithmetic progression, which says that GRH is true on average, and the Zhang-Maynard-Tao theorems on bounded gaps in the primes. Otherwise I am open to suggestions as to what we might cover. Any of the above are possible. We could also discuss work on the distribution of the zeros of the Riemann zeta function or some of the fairly recent work on Waring’s problem.

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