MAT 6932: Introduction to Analytic Number Theory

MWF 8th period (3:00-3:50pm) – LIT 207 – SPRING 2024 – Section 3F91

INSTRUCTOR:

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OFFICE HOURS:

M and W 7th period (1:55 – 2:44 pm) in LIT 304 and by appointment.

PREREQUISITES:

Undergraduate course in number theory and a course in complex variable theory

SPECIFIC TOPIC FOR COURSE:

Analytic Number Theory

COURSE DESCRIPTION:

The study of prime numbers which goes back to the golden age of Greece, continues to be an active area of research today. A number of deceptively simple looking but very hard problems on primes remain open, but have undergone dramatic progress recently. The course will begin with a discussion of various estimates for sums and counting functions involving primes and arithmetical functions. This will serve as a motivation for the Prime Number Theorem conjectured by Gauss and Legendre. It was Riemann who first realized in the mid-nineteenth century that properties of the zeta function as a complex variable function will provide information about the distribution of primes. The Prime Number Theorem was proved towards the end of the nineteen century simultaneously and independently by Hadamard and de la Vallee Poussin using complex function theory and the Riemann zeta function. We shall give this proof which is one of the crowning achievements of the nineteenth century. Following that we will take up other important topics such as Sieve Methods to deal with problems of the Goldbach and prime twins type, and Probabilistic Number Theory focusing on the seminal results of Hardy-Ramanujan, Erdos-Kac and Turan on the distribution of additive functions. Some of these topics may be dealt with in MAT 6932 in Spring
2024.

The course will be self contained and should appeal to any graduate student or advanced undergraduate.

TEXT:

There will be no assigned text. I will use my own notes. A number
of texts will be given as references.

GRADING:

Grades will be based on homework that will be assigned periodically.

ACCOMODATION FOR STUDENTS WITH DISABILITIES:

Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

https://qseries.org/alladik/mat6932-spring-2024/index.html.
Created by fgarvan (*alladik@ufl.edu*) on Thursday, January 04, 2024.

Last update made Thu Jan 4 12:07:34 CST 2024.


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