

**University of Chicago
Paris Mathematics Program
Spring 2018
Course Offerings**

Course 1 (Weeks 1-3): Math 29512: Introduction to p-Groups

March 26-April 12

Instructor: Jitka Stehnova

This course is an introduction to p-groups, which play an important role in solvable groups and Lie Algebras. Beginning from the Sylow structure of groups, we will study commutators, the Frattini subgroup, automorphisms, and central products. The course will include a project. The level of difficulty of the project chosen will determine whether this course may be substituted for Math 25500 or Math 25800 in the BS program.

Course 2 (Weeks 4-6): Math 29507: Geometry of Matrix Groups

April 16-May 4

Instructor: John Boller

We will discuss the structure of general and special linear groups, orthogonal groups, unitary groups, and symplectic groups. These groups are used throughout algebra, topology, and analysis. We will emphasize the roles of matrix groups in each of these fields, and present examples where the knowledge of these groups leads to the solution of interesting problems. The text for the course is *Matrix Groups*, by Morton Curtis. Instead of a final exam, there will be final projects, and the level of difficulty of the project chosen will determine whether this course may be substituted for Math 25500 or Math 25800 in the B.S. degree program.

Course 3 (Weeks 7-9): Math 29519: Introduction to Fourier Analysis

May 7-May 25

Instructor: Takis Souganidis

This will be an elementary introduction to the study of Fourier Series and integrals. We shall ask, "When do Fourier Series converge?" If they do not converge, (and they don't always) we shall ask whether there is some notion that is more general than ordinary convergence, according to which Fourier series represent the function they are supposed to represent. We shall study special cases of Fourier Series that are particularly interesting, such as lacunary series, and random series. We shall cover the relationship between the size of a function and the size of its Fourier coefficients (or, in the non-periodic case) the Fourier Transform. We shall also investigate the relationship between Fourier analysis and partial differential equations, as well as other interesting topics as time permits.

To apply, go to the foreign studies website (<http://study-abroad.uchicago.edu/>) and fill out the on line form for Paris Math Spring 18. There is no need to get a recommendation; we do not require them for this program. We will evaluate your application by considering your math background and your overall transcript. To be eligible to take these math courses, you must have completed any analysis sequence and either Math 25700 or Math 25400.

