

Course Announcement  
*Mathematical Logic and Set Theory*  
Math 220A, Fall Quarter 2019  
MWF 10 am–10:50 am, MS 7608

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**Office hours.** W 11 am–11:50 am.

**Description.** *Mathematical logic* is a group of interrelated mathematical subjects which came about as an outgrowth of the advances in the foundations of mathematics at the threshold to the 20th century. Since its birth during the study of the philosophical underpinnings of mathematics, the subject has grown both in breadth and depth, and has forged connections to many other parts of mathematics, not to mention its important role for the development of computer science. Nowadays, mathematical logic is often divided into the four fields of *set theory*, *model theory*, *recursion theory* (or *computability theory*) and *proof theory*. The topics in this course are part of the common background of mathematicians active in any one of these areas.

**Syllabus.** (From the official course description of the Department.) Fundamental methods and results in mathematical logic, using mathematical methods to reason about existence or nonexistence of proofs and computations in many different settings. Topics include compactness theorem, saturation of models, completeness and incompleteness theorems of Gödel, Turing computability and degrees of unsolvability, recursion in Baire space, Zermelo/Fraenkel axioms, universe of constructible sets, and related equiconsistency results in set theory.

**Prerequisites.** No previous study of logic is assumed. Some undergraduate abstract algebra is helpful, but not necessary.

**Course text.** You will need to take notes in class. No textbook will be required, but the following book is a good companion:

J. Shoenfield, *Mathematical Logic*, A K Peters/CRC Press, 2001.

**Grading.** The final grade will be based on homework (50%), and a final exam (50%).