

LOGIC SEMINAR

Guest Speaker: James Walsh
Cornell University

Date: Tuesday, February 7, 2023

Time: 2:00 PM

Location: 125 Hayes-Healy Hall

Zoom URL: NA



Lecture Title:

New results on incompleteness and ordinal analysis

Abstract

We present an analogue of Gödel's second incompleteness theorem. Whereas Gödel showed that sufficiently strong theories that are Π_1^0 -sound and Σ_1^0 -definable do not prove their own Π_1^0 -soundness, we prove that sufficiently strong theories that are Π_1^1 -sound and Σ_1^1 -definable do not prove their own Π_1^1 -soundness. Our proof does not involve the construction of a self-referential sentence but rather relies on ordinal analysis. We then turn to characterizations of ordinal analysis itself. One of the main goals of ordinal analysis is measuring the "strength" of theories by calculating their proof-theoretic ordinals. But in what sense do proof-theoretic ordinals measure the strength of theories? What is the attendant notion of strength? We provide some abstract answers to this question.