Summary. In a first course on logic the emphasis is on proving theorems within a logical system, whereas in this course we will prove theorems about logical systems. Because of this, this course is quite different in character than an introductory logic course: it is much more mathematical in nature!

We will begin with a brief introduction to types of proofs, basic set theory, and a discussion of the Completeness Theorem of propositional logic. After this we shall concentrate our studies on classical first-order predicate logic. In particular our focus will revolve around two major groups of results: (1) the Completeness Theorem for first-order logic, and (2) Gödel’s First Incompleteness Theorem.

In part (1) we shall study Henkin’s proof, the Compactness Theorem, and the Löwenheim-Skolem Theorem regarding the non-categoricity of the first-order axioms for arithmetic and the existence of non-standard models, while part (2) includes elements of recursive function theory, Gödel numbering and representability, Church’s Theorem on the undecidability of first-order logic, Tarski’s Theorem on the undefinability of truth, and Gödel’s Second Incompleteness Theorem.

Thus, by studying some of the most important theorems of 20th century logic we will learn about the power and the limitations of first-order logic. These technical results have far-reaching philosophical implications (e.g., computational theory of mind, nature of mathematical and scientific theories, Hilbert’s programme).

Prerequisites. Introduction to Deductive Logic (Philosophy 210A), or equivalent. Not open to students who have taken MATH-498.

Textbook. The lectures will follow closely the development in the second half of


The book will be available at The Word Bookstore, 469 Milton Street (5 mins. from the University Street Gates). This text is essential.

Requirements & grading. Students will be required to attend and participate in class, do the assigned readings, complete weekly homework assignments, and take a final exam. The final grade depends on homeworks (70%), final exam (25%), and participation in class (5%). Failure to hand in the homeworks in time will result in the loss of marks.

“In accord with McGill University’s Charter of Students Rights, students in this course have the right to submit in English or in French any written work that is to be graded.”

“McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see http://www.mcgill.ca/integrity for more information).”