
Preface

In this course proofs are given of Gödel's completeness theorem and of some of its consequences, making use of Robinson's completeness theorem and Gödel's compactness theorem for propositional logic. The reader will encounter here other key ideas of logic: a non-ambiguous syntax, the resolution method, Davis-Putnam procedure, Tarski semantics, logical equivalence and logical consequence, Herbrand models, equality axioms, Skolem normal forms, refutations viewed as graphical objects, and the construction of some nonstandard models. The mathematical prerequisites are minimal: the text is accessible to anybody who has already seen some proofs by induction.

These pages are a distillation from numerous courses of Mathematical Logic that I gave at the Department of Information Science of the University of Milan starting from 1996, and subsequently at the Department of Mathematics "Ulisse Dini" of the University of Florence. Various chapters were also tested in a course offered in the academic year 2001-2002 by Collegio Ghislieri to students of various undergraduate courses at the University of Pavia. The current text is the result of a long interaction process between the teacher and students of various cultural backgrounds. My first acknowledgements go to them.

This book can be used in a first course of Mathematical Logic for mathematicians and for computer scientists. Parts of this text can also be useful in a course of Logic for philosophers and linguists, because of numerous, never too difficult, exercises on the connection between logic and natural language. Readers wishing to continue the study of Logic will learn from this course the necessary tools to understand Gödel's incompleteness theorems, for example in the eleven chapters of the monograph of R.M. Smullyan "Gödel's Incompleteness Theorems", Oxford University Press, 1992.

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Florence, November 2010

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Preface to the English edition

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