

1. Record Nr.	UNINA9910812510203321
Autore	Hirschfeld J. W. P (James William Peter), <1940->
Titolo	Algebraic curves over a finite field // J. W. P. Hirschfeld, G. Korchmaros, F. Torres
Pubbl/distr/stampa	Princeton, New Jersey : , : Princeton University Press, , 2008 ©2008
ISBN	1-4008-4741-9
Edizione	[Course Book]
Descrizione fisica	1 online resource (717 p.)
Collana	Princeton Series in Applied Mathematics
Classificazione	SK 240
Disciplina	516.352
Soggetti	Curves, Algebraic Finite fields (Algebra)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Front matter -- Contents -- Preface -- PART 1. General theory of curves -- Chapter One. Fundamental ideas -- Chapter Two. Elimination theory -- Chapter Three. Singular points and intersections -- Chapter Four. Branches and parametrisation -- Chapter Five. The function field of a curve -- Chapter Six. Linear series and the Riemann-Roch Theorem -- Chapter Seven. Algebraic curves in higher-dimensional spaces -- PART 2. Curves over a finite field -- Chapter Eight. Rational points and places over a finite field -- Chapter Nine. Zeta functions and curves with many rational points -- PART 3. Further developments -- Chapter Ten. Maximal and optimal curves -- Chapter Eleven. Automorphisms of an algebraic curve -- Chapter Twelve. Some families of algebraic curves -- Chapter Thirteen. Applications: codes and arcs -- Appendix A. Background on field theory and group theory -- Appendix B. Notation -- Bibliography -- Index
Sommario/riassunto	This book provides an accessible and self-contained introduction to the theory of algebraic curves over a finite field, a subject that has been of fundamental importance to mathematics for many years and that has essential applications in areas such as finite geometry, number theory, error-correcting codes, and cryptology. Unlike other books, this one emphasizes the algebraic geometry rather than the function field approach to algebraic curves. The authors begin by developing the

general theory of curves over any field, highlighting peculiarities occurring for positive characteristic and requiring of the reader only basic knowledge of algebra and geometry. The special properties that a curve over a finite field can have are then discussed. The geometrical theory of linear series is used to find estimates for the number of rational points on a curve, following the theory of Stöhr and Voloch. The approach of Hasse and Weil via zeta functions is explained, and then attention turns to more advanced results: a state-of-the-art introduction to maximal curves over finite fields is provided; a comprehensive account is given of the automorphism group of a curve; and some applications to coding theory and finite geometry are described. The book includes many examples and exercises. It is an indispensable resource for researchers and the ideal textbook for graduate students.
