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Nota di contenuto	Prerequisites: Basics of Set Theory and Integers -- Groups: Introductory Concepts -- Actions of Groups, Topological Groups and semigroups -- Rings: Introductory Concepts -- Ideals of Rings: Introductory concepts -- Factorization in Integral Domains and in Polynomial Rings -- Rings with Chain Conditions -- Vector Spaces -- Modules -- Algebraic Aspects of Number Theory -- Algebraic Numbers -- Introduction to Mathematical Cryptography -- Appendix A: Some Aspects of Semirings -- Appendix B: Category Theory -- Appendix C: A Brief Historical Note. .

Sommario/riassunto

The book is primarily intended as a textbook on modern algebra for undergraduate mathematics students. It is also useful for those who are interested in supplementary reading at a higher level. The text is designed in such a way that it encourages independent thinking and motivates students towards further study. The book covers all major topics in group, ring, vector space and module theory that are usually contained in a standard modern algebra text. In addition, it studies semigroup, group action, Hopf's group, topological groups and Lie groups with their actions, applications of ring theory to algebraic geometry, and defines Zariski topology, as well as applications of module theory to structure theory of rings and homological algebra. Algebraic aspects of classical number theory and algebraic number theory are also discussed with an eye to developing modern cryptography. Topics on applications to algebraic topology, category theory, algebraic geometry, algebraic number theory, cryptography and theoretical computer science interlink the subject with different areas. Each chapter discusses individual topics, starting from the basics, with the help of illustrative examples. This comprehensive text with a broad variety of concepts, applications, examples, exercises and historical notes represents a valuable and unique resource. .