

Bourbaki, N.

Elements of mathematics. Algebra II. Chapters 4–7. Transl. from the French by **P. M. Cohn and J. Howie.** (English) [Zbl 0719.12001](#)

Berlin etc.: Springer-Verlag. approx. 460 p. (1990).

[For a review of the French original (1981) see [Zbl 0498.12001](#).]

The book is a revised and expanded version of Bourbaki's textbook, "Algèbre", Chapters 4 through 7. Its scope is beyond what is normally found in textbooks on algebra.

Chapter 4 is concerned with the theory of polynomials, rational fractions and power series. A section on symmetric tensors and polynomial mappings between modules has been added as well as one on symmetric functions.

An extensive revision of Chapter 5 is presented. The chapter deals with commutative fields. It contains results on prime fields, algebraic, algebraically closed, and radical field extensions. Separable algebraic field extensions and Galois theory are considered and applications to finite fields and abelian extensions are given. Nonalgebraic field extensions are also studied. Topics such as derivations and regular extensions are examined.

Chapter 6 deals with ordered groups and fields.

Chapter 7 studies modules over principal ideal domains. It treats torsion modules, free modules, finitely generated modules with applications to abelian groups and endomorphisms of vector spaces. Sections on semi- simple endomorphisms and Jordan decomposition have been added.

The problem sets and historical comments in the book are excellent. It is a textbook of the highest order.

Reviewer: [J.N.Mordeson \(Omaha\)](#)

MSC:

- [12-02](#) Research exposition (monographs, survey articles) pertaining to field theory
- [13-02](#) Research exposition (monographs, survey articles) pertaining to commutative algebra
- [12Fxx](#) Field extensions
- [12J15](#) Ordered fields
- [13F10](#) Principal ideal rings
- [13C10](#) Projective and free modules and ideals in commutative rings
- [12E05](#) Polynomials in general fields (irreducibility, etc.)
- [06F15](#) Ordered groups
- [05E05](#) Symmetric functions and generalizations

Cited in **3** Reviews
Cited in **69** Documents

Keywords:

[ordered fields](#); [ordered groups](#); [polynomials](#); [rational fractions](#); [power series](#); [symmetric functions](#); [commutative fields](#); [principal ideal domains](#)