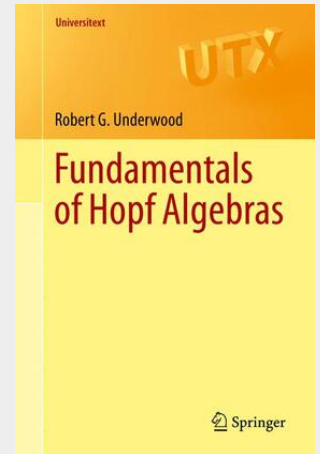Underwood

Fundamentals of Hopf Algebras

This text aims to provide graduate students with a self-contained introduction to topics that are at the forefront of modern algebra, namely, coalgebras, bialgebras and Hopf algebras. The last chapter (Chapter 4) discusses several applications of Hopf algebras, some of which are further developed in the author's 2011 publication, An Introduction to Hopf Algebras. The book may be used as the main text or as a supplementary text for a graduate algebra course. Prerequisites for this text include standard material on groups, rings, modules, algebraic extension fields, finite fields and linearly recursive sequences. The book consists of four chapters. Chapter 1 introduces algebras and coalgebras over a field K; Chapter 2 treats bialgebras; Chapter 3 discusses Hopf algebras and Chapter 4 consists of three applications of Hopf algebras. Each chapter begins with a short overview and ends with a collection of exercises which are designed to review and reinforce the material. Exercises range from straightforward applications of the theory to problems that are devised to challenge the reader. Questions for further study are provided after selected exercises. Most proofs are given in detail, though a few proofs are omitted since they are beyond the scope of this book.

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