Design Theory Zhe Xian Wan

This monograph provides a self-contained presentation of the foundations of finite fields, including a detailed treatment of their algebraic closures. It also covers important advanced topics which are not yet found in textbooks: the primitive normal basis theorem, the existence of primitive elements in affine hyperplanes, and the Niederreiter method for factoring polynomials over finite fields. We give streamlined and/or clearer proofs for many fundamental results and treat some classical material in an innovative manner. In particular, we emphasize the interplay between arithmetical and structural results, and we introduce Berlekamp algebras in a novel way which provides a deeper understanding of Berlekamp's celebrated factorization algorithm. The book provides a thorough grounding in finite field theory for graduate students and researchers in mathematics. In view of its emphasis on applicable and computational aspects, it is also useful for readers working in information and communication engineering, for instance, in signal processing, coding theory, cryptography or computer science.

This is a textbook for graduate and upper level undergraduate students in mathematics, computer science, communication engineering and other fields. The explicit construction of finite fields and the computation

in finite fields are emphasised. In particular, the construction of
irreducible polynomials and the normal basis of finite fields are
included. The essentials of Galois rings are also presented. This
invaluable book has been written in a friendly style, so that
lecturers can easily use it as a text and students can use it for self-
study. A great number of exercises have been incorporated.

IEEE International Symposium on Information Theory
Reviews in Number Theory, 1984-96
Pacific Research Centres
A Directory of Organizations in Science, Technology, Agriculture, and
Medicine
Electrical & electronics abstracts. Series B

This book deals with the basic subjects of design theory. It begins with balanced incomplete block designs, various constructions of which are described in ample detail. In particular, finite projective and affine planes, difference sets and Hadamard matrices, as tools to construct balanced incomplete block designs, are included. Orthogonal latin squares are also treated in detail. Zhu's simpler proof of the falsity of Euler's conjecture is included. The construction of some classes of balanced incomplete block designs, such as Steiner triple systems and Kirkman triple systems, are also given. T-designs and partially balanced incomplete block designs (together with association schemes), as generalizations of balanced incomplete block designs, are included. Some coding theory related to Steiner triple systems are clearly explained. The book is written in a lucid style and is algebraic in

nature. It can be used as a text or a reference book for graduate students and researchers in combinatorics and applied mathematics. It is also suitable for self-study.

Algebraic combinatorics is the study of combinatorial objects as an extension of the study of finite permutation groups, or, in other words, group theory without groups. In the spirit of Delsarte's theory, this book studies combinatorial objects such as graphs, codes, designs, etc. in the general framework of association schemes, providing a comprehensive overview of the theory as well as pointing out to extensions.

The British National Bibliography

Books in Print Supplement

American Scientist

Proceedings: Sorrento Palace Hotel Conference Center, Sorrento, Italy, 25-30 June, 2000

Design Theory

Approximately 3500 entries to "corporate, official, and academic research, development and innovative laboratives [sic] and centres which carry out or finance research, development and innovative work." Covers 21 countries. Geographical arrangement. Each entry gives address, telephone, status, administrative officer, activities, publications, and other descriptive information. Establishments and subject indexes.

"This book deals with the basic subjects of design theory. It begins with balanced incomplete block designs, various constructions of which are described in ample detail. In particular, finite projective and affine planes, difference sets and Hadamard

matrices, as tools to construct balanced incomplete block designs, are included. Orthogonal latin squares are also treated in detail. Zhu's simpler proof of the falsity of Euler's conjecture is included. The construction of some classes of balanced incomplete block designs, such as Steiner triple systems and Kirkman triple systems, are also given. T-designs and partially balanced incomplete block designs (together with association schemes), as generalizations of balanced incomplete block designs, are included. Some coding theory related to Steiner triple systems are clearly explained. The book is written in a lucid style and is algebraic in nature. It can be used as a text or a reference book for graduate students and researchers in combinatorics and applied mathematics. It is also suitable for self-study."--
Series B.
Quaternary Codes
A World Directory of Organizations and Programmes
Conference Record
Science Periodicals from Mainland China
Hsio-Fu Tuan is a Chinese mathematician who has made important contributions to the theories of both finite groups and Lie groups. He has also had a great influence on the development of algebra, and particularly group theory in China. The present volume consists of a collection of essays on various aspects of group theory written by some of his former students and colleagues in honour of his 80th birthday. The papers contain the main general results, as well as recent ones, on certain topics within this discipline. The chief editor, Zhe-Xian Wan, is a leading algebraist in China.
This book is an introduction to module theory for the reader who knows something about linear algebra

and ring theory. Its main aim is the derivation of the structure theory of modules over Euclidean domains. This theory is applied to obtain the structure of abelian groups and the rational canonical and Jordan normal forms of matrices. The basic facts about rings and modules are given in full generality, so that some further topics can be discussed, including projective modules and the connection between modules and representations of groups. The book is intended to serve as supplementary reading for the third or fourth year undergraduate who is taking a course in module theory. The further topics point the way to some projects that might be attempted in conjunction with a taught course. Contents:Rings and IdealsEuclidean DomainsModules and SubmodulesHomomorphismsFree ModulesQuotient Modules and Cyclic ModulesDirect Sums of ModulesTorsion and the Primary DecompositionPresentationsDiagonalizing and Inverting MatricesFitting IdealsThe Decomposition of ModulesNormal Forms for MatricesProjective Modules Readership: Final year undergraduates and new graduate students in pure mathematics. Keywords:Module;Commutative Ring;Euclidean Domain;Fitting Ideal;Matrix Diagonalization;Invariant Factor;Elementary Divisor;Rational Canonical Form;Jordan Normal Form

A Translation of Sūgaku

A First Course in Module Theory

Proceedings, ... IEEE International Symposium on Information Theory

Group Theory in China

Gazette - Australian Mathematical Society

This book in its Second Edition is a useful, attractive introduction to basic counting techniques for upper secondary to undergraduate students, as well as teachers. Younger

students and lay people who appreciate mathematics, not to mention avid puzzle solvers, will also find the book interesting. The various problems and applications here are good for building up proficiency in counting. They are also useful for honing basic skills and techniques in general problem solving. Many of the problems avoid routine and the diligent reader will often discover more than one way of solving a particular problem, which is indeed an important awareness in problem solving. The book thus helps to give students an early start to learning problem-solving heuristics and thinking skills.New chapters originally from a supplementary book have been added in this edition to substantially increase the coverage of counting techniques. The new chapters include the Principle of Inclusion and Exclusion, the Pigeonhole Principle, Recurrence Relations, the Stirling Numbers and the Catalan Numbers. A number of new problems have also been added to this edition.

This IMA Volume in Mathematics and its Applications Coding Theory and Design Theory Part I: Coding Theory is based on the proceedings of a workshop which was an integral part of the 1987-88 IMA program on APPLIED COMBINATORICS. We are grateful to the Scientific Committee: Victor Klee (Chairman), Daniel Kleitman, Dijen Ray-Chaudhuri and Dennis Stanton for planning and implementing an exciting and stimulating year long program. We especially thank the Workshop Organizer, Dijen Ray-Chaudhuri, for organizing a workshop which brought together many of the major figures

in a variety of research fields in which coding theory and design theory are used. A vner Friedman Willard Miller, Jr. PREFACE Coding Theory and Design Theory are areas of Combinatorics which found rich applications of algebraic structures. Combinatorial designs are generalizations of finite geometries. Probably, the history of Design Theory begins with the 1847 pa per of Reverand T. P. Kirkman "On a problem of Combinatorics", Cambridge and Dublin Math. Journal. The great Statistician R. A. Fisher reinvented the concept of combinatorial 2-design in the twentieth century. Extensive application of alge braic structures for construction of 2-designs (balanced incomplete block designs) can be found in R. C. Bose's 1939 Annals of Eugenics paper, "On the construction of balanced incomplete block designs". Coding Theory and Design Theory are closely interconnected. Hamming codes can be found (in disguise) in R. C. Bose's 1947 Sankhya paper "Mathematical theory of the symmetrical factorial designs".

Bulletin

Finite Fields and Galois Rings

Mathematical Reviews

Algebraic Combinatorics

2000 IEEE International Symposium on Information Theory

These six volumes include approximately 20,000 reviews of items in number theory that appeared in Mathematical Reviews between 1984 and 1996. This is the third such set of

volumes in number theory. The first was edited by W.J. LeVeque and included reviews from 1940-1972; the second was edited by R.K. Guy and appeared in 1984. With the publication of these review volumes, readers now have available reviews in number theory covering more than half a century.

In recent years quaternary codes have attracted the attention of the coding community as several notorious binary nonlinear codes containing more codewords than any known linear codes were found to be binary images under the Gray map of linear codes over 94. This discovery opens the way for a broader study of quaternary codes, which constitute a rapidly growing area of coding theory. This book is based on the author's lectures in Xi'an, China and Lund, Sweden and covers the most recent developments of this theory. Contents: Quaternary Linear Codes and Their Generator MatricesWeight EnumeratorsThe Gray Map94-Linearity and (94-Nonlinearity of Some Binary Linear CodesHensel's Lemma and Hensel LiftGalois RingsCyclic CodesKerdock CodesPreparata CodesGeneralizations of Quaternary Kerdock and Preparata CodesQuaternary Quadratic Residue CodesQuaternary Codes and LatticesSome Invariant TheorySelf-Dual Quaternary Codes and Their Weight Enumerators Readership: Applied mathematicians. keywords:Quaternary Codes;Kerdock Codes;Preparata Code;Delsarte-Goethals Codes;Quadratic Residue Codes

American Book Publishing Record Cumulative 1998

Bulletin of the Institute of Combinatorics and Its Applications
A Directory of Scientific, Industrial, Agricultural, and Biomedical Laboratories
Singapore National Bibliography
Electronics Research Centres

Manufacturing industry has been one of the key drivers for recent rapid global economic development. Globalisation of manufacturing industries due to distributed design and labour advantage leads to a drive and thirst for technological advancements and expertise in the fields of advanced design and manufacturing. This development results in many economical benefits to and improvement of quality of life for many people all over the world. This rapid development also creates many opportunities and challenges for both industrialists and academics, as the design requirements and constraints have completely changed in this global design and manufacture environment. Consequently the way to design, manufacture and realise products have changed as well. More and more design and manufacture tasks can now be undertaken within computer environment using simulation and virtual reality technologies. These technological advancements hence support more advanced product development and manufacturing operations in such a global design and manufacturing environment. In this global context and scenario, both industry and the academia have an urgent need to equip themselves with the latest knowledge, technology and methods developed for engineering design and manufacture.

A large portion of the book can be used as a textbook for graduate and upper level undergraduate students in mathematics, communication engineering, computer science and other fields. The remaining part can be used as references for specialists. Explicit construction and computation of finite fields are emphasized. In particular, the construction of irreducible polynomials and normal basis of finite field is

included. A detailed treatment of optimal normal basis and Galoi's rings is included. It is the first time that the galois rings are in book form. Errata(s) Errata

Annual Report for the Year

Combinatorics And Graph Theory '95 - Proceedings Of The Summer School And International Conference On Combinatorics

Part I Coding Theory

Index to IEEE Publications

Lectures on Finite Fields and Galois Rings