

# About Pearson

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# MATHEMATICS

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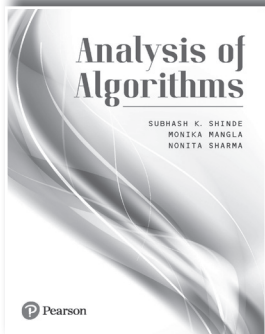




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## Analysis of Algorithms



ISBN: 9789390394135



Subhash K. Shinde | Monika Mangla | Nonita Sharma



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### ABOUT THE BOOK

The purpose of this textbook is to introduce the reader to the basics of algorithms, analysis techniques, and designing of several algorithmic techniques in a simplistic and practical way. This book is especially designed to present the concepts in a naïve and easy fashion so that readers can grasp the concepts easily and can apply them for solving real-life problems. More emphasis has been laid on presenting the several mathematical concepts in a detailed and descriptive manner. The book has been specifically crafted for the subject - Design and Analysis of the Algorithms with an aim to assimilate the basics of algorithm analysis for an introductory graduate

course. It can also be used as a reference for self-study by researchers in the field of Computer Science or Computer Applications. Additionally, it can serve as an exemplar guide for the students in mathematics and allied branches to understand the principles of Analysis of Algorithms and Data structures. Hence, the book serves to establish a platform to understand the fundamentals of the subject persuading its readers to strive in-depth and multidimensional knowledge of the advanced topics related to the application of subject in real life scenario.

### FEATURES

- Presentation of the concepts in the simplistic and descriptive manner.
- Numerical examples for enhanced understanding of the readers for each topic.
- Coverage of wide range of algorithmic techniques instead of focusing only on techniques.
- Inclusion of Exercise questions at the end of each chapter for self-practicing.
- Appendix at the end consisting of multiple-choice questions enabling the readers to assess their understandability.
- The book also contains programs in c language in appendix section that helps the readers to practically implement the concept

### CONTENTS

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| 5. Analyzing Algorithms         | 13. Approximation Algorithms |
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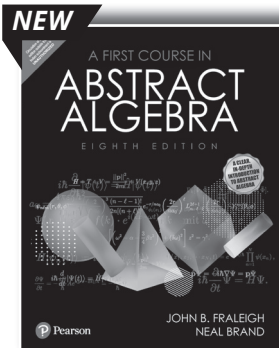
### ABOUT THE AUTHOR(S)

Subhash K. Shinde, Professor and Vice Principal Lokmanya Tilak College of Engineering Navi Mumbai

Monika Mangla, Head of Department for Computer Science and Engineering (AI&ML) Lokmanya Tilak College of Engineering Navi Mumbai

Nonita Sharma, Assistant Professor Dr B. R Ambedkar National Institute of Technology Jalandhar

## A First Course in Abstract Algebra, 8/e



ISBN: 9789356067059

John B. Fraleigh | Neal Brand

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## ABOUT THE BOOK

A First Course in Abstract Algebra, 8th Edition retains its hallmark goal of covering all the topics needed for an in-depth introduction to abstract algebra — and is designed to be relevant to future graduate students, future high school teachers, and students who intend to work in industry. New co-author Neal Brand has revised this classic text carefully and thoughtfully, drawing on years of experience teaching the course with this text to produce a meaningful and worthwhile update. This in-depth introduction gives students a firm foundation for more specialized work in algebra by including extensive explanations of the what, the how, and the

why behind each method the authors choose.

## FEATURES

- A focus on groups, rings and fields gives students a firm foundation for more specialized work by emphasizing an understanding of the nature of algebraic structures.
- Gives clear and concise explanations of the theory, with well-thought-out examples to highlight key points and clarify more difficult concepts.
- UPDATED - Many exercises in the text have been updated, and many are new. Most exercise sets are broken down into parts consisting of computations, concepts, and theory.
- NEW - Applied topics — such as RSA encryption and coding theory as well as examples of applying Gröbner bases — have been added to the 8th Edition.
- Historical notes written by Victor Katz, an authority on the history of math, provide valuable perspective.

## CONTENTS

## I. Groups and Subgroups

1. Binary Operations
2. Groups
3. Abelian Groups
4. Nonabelian Examples
5. Subgroups
6. Cyclic Groups
7. Generating Sets and Cayley Digraphs

## II. Structure of Groups

8. Groups and Permutations
9. Finitely Generated Abelian Groups
10. Cosets and the Theorem of Lagrange
11. Plane Isometries

## III. Homomorphisms and Factor Groups

12. Factor Groups
13. Factor-Group Computations and Simple Groups
14. Groups Actions on a Set
15. Applications of G -Sets to Counting

## IV. Advanced Group Theory

16. Isomorphism Theorems
17. Sylow Theorems

## 18. Series of Groups

## 19. Free Abelian Groups

## 20. Free Groups

## 21. Group Presentations

## V. Rings and Fields

## 22. Rings and Fields

## 23. Integral Domains

## 24. Fermat's and Euler's Theorems

## 25. Encryption

## VI. Constructing Rings and Fields

## 26. The Field of Quotients of an Integral Domain

## 27. Rings and Polynomials

## 28. Factorization of Polynomials over Fields

## 29. Algebraic Coding Theory

## 30. Homomorphisms and Factor Rings

## 31. Prime and Maximal Ideals

## 32. Noncommutative Examples

## VII. Commutative Algebra

## 33. Vector Spaces

## 34. Unique Factorization Domains

## 35. Euclidean Domains

- 36. Number Theory
- 37. Algebraic Geometry
- 38. Gröbner Basis for Ideals

#### VIII. Extension Fields

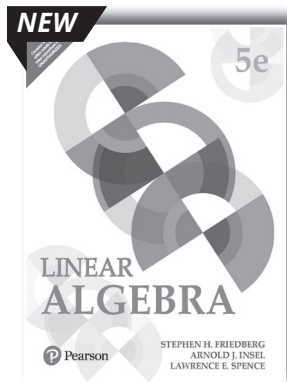
- 39. Introduction to Extension Fields
- 40. Algebraic Extensions
- 41. Geometric Constructions
- 42. Finite Fields

#### ABOUT THE AUTHOR(S)

John B Fraleigh, University of Rhode Island  
Neal Brand, University of North Texas

#### IX. Galois Theory

- 43. Introduction to Galois Theory
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- 45. Separable Extensions
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- 48. Cyclotomic Extensions
- 49. Insolvability of the Quintic



ISBN: 9789390168132

## Linear Algebra, 5/e

 Stephen H. Friedberg | Arnold J. Insel | Lawrence E. Spence

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#### ABOUT THE BOOK

This acclaimed theorem-proof text presents a careful treatment of the principal topics of linear algebra. It emphasizes the symbiotic relationship between linear transformations and matrices, but states theorems in the more general infinite-dimensional case where appropriate. Applications to such areas as differential equations, economics, geometry, and physics appear throughout, and can be included at the instructor's discretion.

This book is especially suited to a second course in linear algebra that emphasizes abstract vector spaces, although it can be used in a first course with a strong

theoretical emphasis. Updates to the 5th Edition include revised proofs of some theorems, additional examples, and new exercises. Also new in this revision are online solutions for selected theoretical exercises, accessible by short URLs at point-of-use.

#### FEATURES

- Revised - A streamlined presentation, with clarified exposition informed by extensive reviews from instructors.
- Revised - Proofs of some theorems have been revised for further clarification.
- New - Additional examples and exercises throughout.
- New - Online solutions to selected theoretical exercises in each section of the book:
  - These exercises each have their exercise number printed within a gray box, and the last sentence of each of these exercises gives a short URL for its online solution.
- New - Four new applications available online of the content in Sections 2.3, 5.3, 6.5, and 6.6. Short URLs at point-of-use provide easy access to this material.

#### CONTENTS

1. Vector Spaces
2. Linear Transformations and Matrices
3. Elementary Matrix Operations and Systems of Linear Equations
4. Determinants
5. Diagonalization
6. Inner Product Spaces
7. Canonical Forms

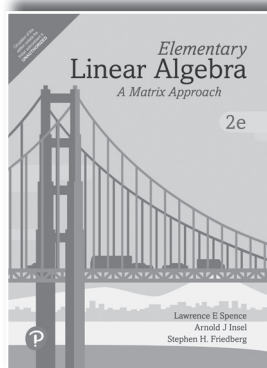


## ABOUT THE AUTHOR(S)

**Stephen H. Friedberg** holds a BA in mathematics from Boston University and MS and PhD degrees in mathematics from Northwestern University, and was awarded a Moore Postdoctoral Instructorship at MIT. He served as a director for CUPM, the Mathematical Association of America's Committee on the Undergraduate Program in Mathematics. He was a faculty member at Illinois State University for 32 years, where he was recognized as the outstanding teacher in the College of Arts and Sciences in 1990. He has also taught at the University of London, the University of Missouri, and at Illinois Wesleyan University. He has authored or coauthored articles and books in analysis and linear algebra.

**Arnold J. Insel** received BA and MA degrees in mathematics from the University of Florida and a PhD from the University of California at Berkeley. He served as a faculty member at Illinois State University for 31 years and at Illinois Wesleyan University for two years. In addition to authoring and co-authoring articles and books in linear algebra, he has written articles in lattice theory, topology, and topological groups.

**Lawrence E. Spence** holds a BA from Towson State College and MS and PhD degrees in mathematics from Michigan State University. He served as a faculty member at Illinois State University for 34 years, where he was recognized as the outstanding teacher in the College of Arts and Sciences in 1987. He is an author or co-author of nine college mathematics textbooks, as well as articles in mathematics journals in the areas of discrete mathematics and linear algebra.



ISBN: 9789353432997

## Elementary Linear Algebra, 2/e



Lawrence E. Spence | Arnold J. Insel | Stephen H. Friedberg



648 | © 2019



## ABOUT THE BOOK

Based on the recommendations of the Linear Algebra Curriculum Study Group, this introduction to linear algebra offers a matrix-oriented approach with more emphasis on problem solving and applications. Throughout the text, use of technology is encouraged. The focus is on matrix arithmetic, systems of linear equations, properties of Euclidean  $n$ -space, eigenvalues and eigenvectors, and orthogonality. Although matrix-oriented, the text provides a solid coverage of vector spaces.

## FEATURES

- Examples in book are accompanied by similar practice problems that enable students to test their understanding of the material.
- Most sections include approximately twenty true/false exercises designed to test students understanding of the conceptual ideas in each section.
- For a proof-oriented course, the authors have included a significant number of accessible exercises requiring proofs, ordered according to difficulty.
- All computational exercises are designed so that the calculations involve "nice" numbers.
- The authors have added an appendix introducing MATLAB.

## CONTENTS

1. Matrices, Vectors, and Systems of Linear Equations
2. Matrices and Linear Transformations
3. Determinants
4. Subspaces and Their Properties
5. Eigenvalues, Eigenvectors, and Diagonalization
6. Orthogonality
7. Vector Spaces

## ABOUT THE AUTHOR(S)

**Stephen H. Friedberg**, Illinois State University

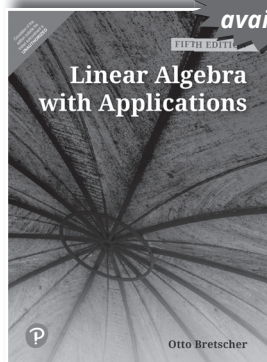
**Arnold J. Insel**, Illinois State University

**Lawrence E. Spence**, Illinois State University

## Linear Algebra with Applications, 5/e

 **Otto Bretscher**

 **528** | © **2019**



**E-Book  
available**

**ISBN: 9789353433048**

### ABOUT THE BOOK

Linear Algebra with Applications, Fifth Edition emphasizes linear transformations as a unifying theme. This elegant textbook combines a user-friendly presentation with straightforward, lucid language to clarify and organize the techniques and applications of linear algebra. Exercises and examples make up the heart of the text, with abstract exposition kept to a minimum. Exercise sets are broad and varied and reflect the author's creativity and passion for this course.

### FEATURES

- **Linear transformations** are introduced early in the text to make the discussion of matrix operations more meaningful and easier to navigate.
- **Visualization and geometrical interpretation** are emphasized extensively throughout the text.
- **Fifty to sixty True/False questions** conclude every chapter, testing conceptual understanding and encouraging students to read the text.
- **Historical problems** from ancient Chinese, Indian, Arabic, and early European sources add diversity to the selection of exercises.
- **Rotations, reflections, projections, and shears** are used throughout to illustrate new ideas.
- **Commutative diagrams** enable students to visualize the relations between linear transformations.

### CONTENTS

1. Linear Equations
2. Linear Transformations
3. Subspaces of  $R^n$  and Their Dimensions
4. Linear Spaces
5. Orthogonality and Least Squares
6. Determinants
7. Eigenvalues and Eigenvectors
8. Symmetric Matrices and Quadratic Forms
9. Linear Differential Equations

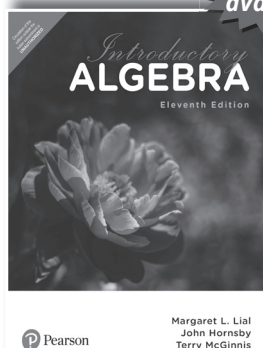
### ABOUT THE AUTHOR

Otto Bretscher, Colby College, Waterville

## Introductory Algebra, 11/e

 **Marge Lial | John Hornsby | Terry McGinnis**

 **752** | © **2019**



**E-Book  
available**

**ISBN: 9789353436896**

### ABOUT THE BOOK

This book has helped thousands of students succeed in the **Introductory Algebra** course by combining clear, concise writing and examples with carefully crafted exercises to support skill development and conceptual understanding. Written with the developmental learner in mind, the precise, accessible writing style delivers help precisely when needed. This revision faithfully continues to support students with enhancements in the text to encourage conceptual understanding beyond skills and procedures. Student-oriented features throughout the text, including the *Relating Concepts exercises*, *Guided Solutions*, and the *Test Your Word Power*, make this text one of the most well-rounded and student-friendly on the market.

## FEATURES

- **Learning Objectives** begin each section, and all material is keyed to these objectives to let students and instructors know exactly what will be covered.
- An **emphasis on problem solving** is introduced and integrated as a six-step process for solving application problems algebraically: *Read, Assign a Variable, Write an Equation, Solve, State the Answer, and Check.*
- **Margin Problems** allow students to immediately practice the example material and check their answer at the bottom of the page in preparation for the exercise sets.
- **Pointers** within examples, **Cautions** and **Notes** provide students with important, on-the-spot reminders and warnings about common pitfalls.
- **Real-Life Applications** with interesting data are used in many new or updated examples and exercises throughout the text.

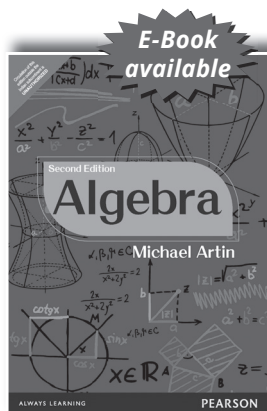
## CONTENTS

1. The Real Number System
2. Equations, Inequalities, and Applications
3. Graphs of Linear Equations and Inequalities in Two Variables
4. Systems of Linear Equations and Inequalities
5. Exponents and Polynomials
6. Factoring and Applications
7. Rational Expressions and Applications
8. Roots and Radicals
9. Quadratic Equations

## ABOUT THE AUTHOR(S)

**Marge Lial** was a pioneering author and a visionary teacher who established features that are now standard in nearly all developmental math titles.

**John Hornsby** have experience of more than twenty-five years of teaching at the high school and university levels and fifteen years of writing mathematics textbooks.



ISBN: 9789332549838

## Algebra, 2/e

 **Michael Artin**

 **560** | © **2015**

## ABOUT THE BOOK

*Algebra, Second Edition*, by Michael Artin, is ideal for the honors undergraduate or introductory graduate course. The second edition of this classic text incorporates twenty years of feedback and the author's own teaching experience. The text discusses concrete topics of algebra in greater detail than most texts, preparing students for the more abstract concepts; linear algebra is tightly integrated throughout.

## FEATURES

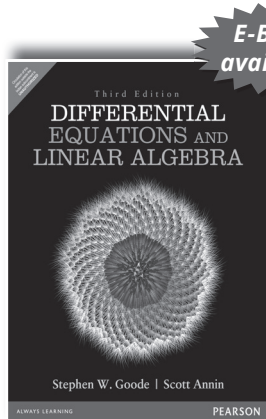
- High emphasis on concrete topics, such as symmetry, linear groups, quadratic number fields, and lattices, prepares students to learn more abstract concepts. The focus on these special topics also allows some abstractions to be treated more concisely, devoting more space to the areas students are the most interested in.
- The chapter organization emphasizes the connections between algebra and geometry at the start, with the beginning chapters containing the content most important for students in other fields. To counter the fact that arithmetic receives less initial emphasis, the later chapters have a strong arithmetic slant.
- Treatment beyond the basics sets this book apart from others. Students with a reasonably mature mathematical background will benefit from the relatively informal treatments the author gives to the more advanced topics.
- Content notes in the preface include teaching tips from the author's own classroom experience.
- Challenging exercises are indicated with an asterisk, allowing instructors to easily create the right assignments for their class.

## CONTENTS

1. Matrices
2. Groups
3. Vector Spaces
4. Linear Operators
5. Applications of Linear Operators
6. Symmetry
7. More Group Theory
8. Bilinear Forms
9. Linear Groups
10. Group Representations
11. Rings
12. Factoring
13. Quadratic Number Fields
14. Linear Algebra in a Ring
15. Fields
16. Galois Theory

## ABOUT THE AUTHOR

**Michael Artin** (born 1934) is an American mathematician and a professor at MIT, known for his contributions to algebraic geometry. He is the son of Emil Artin. He was brought up in Indiana. In the early 1960s he spent time at the IHES in France, contributing to the SGA4 volumes of the Séminaire de géométrie algébrique, on topos theory and étale cohomology. He also worked on the question of characterising the representable functors in the category of schemes; this led to the Artin approximation theorem, in local algebra. This work also gave rise to the ideas of an algebraic space and algebraic stack, and has proved very influential in moduli theory. Additionally, he has made contributions to the deformation theory of algebraic varieties. In 2002, he won the American Mathematical Society's annual Steele Prize for Lifetime Achievement. He is currently working on non-commutative rings, especially geometric aspects.



E-Book  
available

ISBN: 9789332571631

## Differential Equations and Linear Algebra, 3/e



Stephen W. Goode



800 | © 2015

## ABOUT THE BOOK

“For combined differential equations and linear algebra courses teaching students who have successfully completed three semesters of calculus. This complete introduction to both differential equations and linear algebra presents a carefully balanced and sound integration of the two topics. It promotes in-depth understanding rather than rote memorization, enabling students to fully comprehend abstract concepts and leave the course with a solid foundation in linear algebra. Flexible in format, it explains concepts clearly and logically with an abundance of examples and illustrations, without sacrificing level or rigor. A vast array of problems supports the material, with varying levels from which students/instructors can choose.”

## CONTENTS

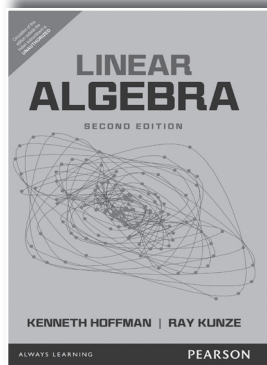
1. First-Order Differential Equations
2. Matrices and Systems of Linear Equations
3. Determinants
4. Vector Spaces
5. Linear Transformation
6. Linear Differential Equations of Order  $n$
7. Systems of Differential Equations
8. The Laplace Transform and Some Elementary Applications
9. Series Solutions to Linear Differential Equations

### Appendices

- A. Review of Complex Numbers
- B. Review of Partial Fractions
- C. Review of Integration Techniques
- D. Linearly Independent Solutions to  $x^2y'' + xp(x)y' + q(x)y = 0$
- E. Answers to Odd-Numbered Exercises”

## ABOUT THE AUTHOR(S)

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**Scott A. Annin**, California State University, Fullerton



ISBN: 9789332550070

## Linear Algebra, 2/e

 Kenneth M Hoffman | Ray Kunze

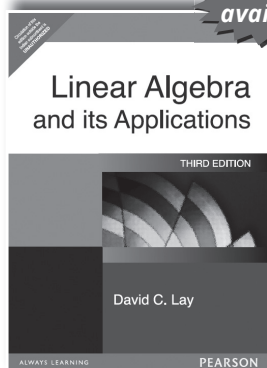
 592 | © 2015

### ABOUT THE BOOK

This introduction to linear algebra features intuitive introductions and examples to motivate important ideas and to illustrate the use of results of theorems.

### CONTENTS

1. Linear Equations
2. Vector Spaces
3. Linear Transformations
4. Polynomials
5. Determinants
6. Elementary canonical Forms
7. Rational and Jordan Forms
8. Inner Product Spaces
9. Operators on Inner Product Spaces
10. Bilinear Forms



ISBN: 9788177583335

*E-Book available*

## Linear Algebra and Its Applications, 3/e

 David C. Lay

 580 | © 2002

### ABOUT THE BOOK

Linear algebra is relatively easy for students during the early stages of the course, when the material is presented in a familiar, concrete setting. But when abstract concepts are introduced, students often hit a brick wall. Instructors seem to agree that certain concepts (such as linear independence, spanning, subspace, vector space, and linear transformations), are not easily understood, and require time to assimilate. Since they are fundamental to the study of linear algebra, students understanding of these concepts is vital to their mastery of the subject. Lay introduces these concepts early in a familiar, concrete  $\mathbb{R}^n$  setting, develops them gradually, and returns to them again and again throughout the text. Finally, when discussed in the abstract, these concepts are more accessible.

### FEATURES

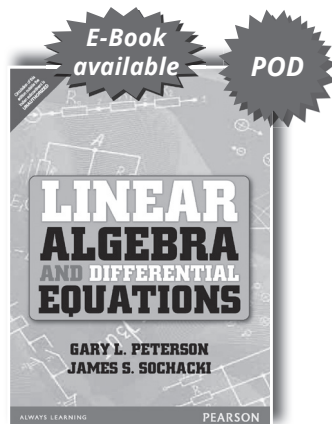
- Fundamental ideas of linear algebra are introduced within the first seven lectures, in the concrete setting of  $\mathbb{R}^n$ , and then gradually examined from different points of view. Later generalizations of these concepts appear as natural extensions of familiar ideas.
- Focus on visualization of concepts throughout the book.
- Icons in the margins to flag topics for which expanded or enhanced material is available on the Web.
- A modern view of matrix multiplication is presented. Definitions and proofs focus on the columns of a matrix rather than on the matrix entries.
- Numerical Notes give a realistic flavor to the text. Students are reminded frequently of issues that arise in the real-life use of linear algebra.
- Each major concept in the course is given a geometric interpretation because many students learn better when they can visualize an idea.

## CONTENTS

1. Linear Equations in Linear Algebra.
2. Matrix Algebra.
3. Determinants.
4. Vector Spaces.
5. Eigenvalues and Eigenvectors.
6. Orthogonality and Least-Squares.
7. Symmetric Matrices and Quadratic Forms.

## ABOUT THE AUTHOR

David C. Lay has been an educator and research mathematician since 1966, mostly at the University of Maryland, College Park. He has also served as a visiting professor at the University of Amsterdam, the Free University in Amsterdam, and the University of Kaiserslautern, Germany. He has over 30 research articles published in functional analysis and linear algebra.



ISBN: 9789332552463

## Linear Algebra and Differential Equations



Gary L. Peterson | James S. Sochacki



480 | © 2015

## ABOUT THE BOOK

*Linear Algebra and Differential Equations* has been written for a one-semester combined linear algebra and differential equations course, yet it contains enough material for a two-term sequence in linear algebra and differential equations. By introducing matrices, determinants, and vector spaces early in the course, the authors are able to fully develop the connections between linear algebra and differential equations. The book is flexible enough to be easily adapted to fit most syllabi, including separate courses that cover linear algebra in the first followed by differential equations in the second. Technology is fully integrated where appropriate, and the text offers fresh and relevant applications to motivate student interest.

## FEATURES

- Offers a solid foundation in both linear algebra and differential equations, with an emphasis on finding connections between the two subjects.
- Contains applications to many areas, including engineering, business, and life sciences.
- Maple exercises incorporated throughout; support is also offered to users of Mathematica and Matlab in the technology resource manual.

## CONTENTS

1. Matrices and Determinants.
2. Vector Spaces.
3. First Order Ordinary Differential Equations.
4. Linear Differential Equations.
5. Linear Transformations and Eigenvalues and Eigenvectors.
6. Systems of Differential Equations.
7. The Laplace Transform.
8. Power Series Solutions to Linear Differential Equations.
9. Inner Product Spaces.

Answers to Odd-Numbered Exercises.

Index of Maple Commands.

## ABOUT THE AUTHOR(S)

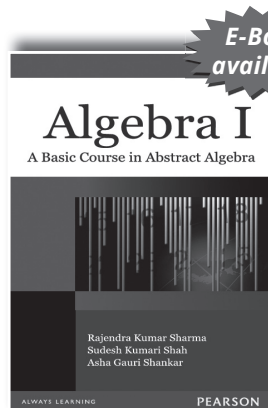
Gary L. Peterson, James Madison University  
James S. Sochacki, James Madison University



# Algebra I: A Basic Course in Abstract Algebra

Rajendra Kumar Sharma | Sudesh Kumari Shah | Asha Gauri Shankar

780 | © 2011



ISBN: 9788131760864

## FEATURES

- Learning Objectives
- Chapter end summary for quick revision
- Geometric interpretation of the concept
- Answer to exercise
- Hints to difficult problems

## CONTENTS

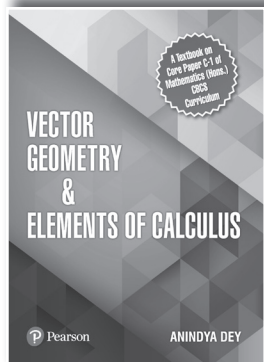
1. Sets & Relations
2. Binary Operations
3. Function
4. Number system
5. Group
6. Group, properties and characteristics
7. Subgroup
8. Cyclic Subgroup
9. Rings
10. System of Linear Equations
11. Matrices
12. Matrices & Linear Transformations
13. Vector Space
14. Basis & Dimensions
15. Linear Transformations
16. Change of Basis
17. Eigen Value & Eigen Vector
18. Markov Process

## ABOUT THE AUTHOR(S)

**Rajendra Kumar Sharma** is a Professor and Head of Department of Mathematics at Indian Institute of Technology Delhi. He has been teaching undergraduate and postgraduate students for more than 20 years.

**Sudesh Kumari Shah** is Associate Professor in Department of Mathematics at Sri Venkateshwra College, University of Delhi. She has been teaching the undergraduate and postgraduate students of Delhi University of more than 30 years.

**Asha Gauri Shankar** is Associate Professor in Department of Mathematics at Lakshmibai College, University of Delhi. She has received Shiksha Ratan Puraskar by India International Friendship Society.



ISBN: 9789354498756

## Vector Geometry and Elements of Calculus

 **Anindya Dey**

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### ABOUT THE BOOK

The present volume VECTOR GEOMETRY & ELEMENTS OF CALCULUS is primarily a textbook meant for the students beginning their academic journey with mathematics as their major subject in the CBCS curriculum. The book although consists of nine chapters on four different topics (viz. Vectors, Geometry, Calculus and Differential equations of first order) it is not just a compiled work—instead, the author claims to render some ingenuity in its representation as he has made honest attempts to twine these heterogeneous topics by making sensible yet limited use of vector and matrix algebra occasionally in the branches Geometry and Calculus

and tried to invoke physical insight to what is being taught to instill a spirit of global learning into the readers. Incisive remarks put at the ends of some worked-out examples and some of the theoretical discussions are exceptionally bright features not commonly found in the popular texts.

### FEATURES

- Written based on the UGC proposed CBCS curriculum and more than 100% coverage of the topics prescribed in the core paper C- 1 [Calculus]
- Over 375 worked-out examples: 80% meant for mediocre students and 20% designed for advanced learners
- Over 350 MCQ's on the content of this book
- More than 180 figures to supplement the text
- End-of-chapter exercises of different variety for providing the learner's good practice
- Hints and Solutions to the exercises
- Bridging of different ideas of the four main areas through cross-references
- Compactness and lucidity of presentation

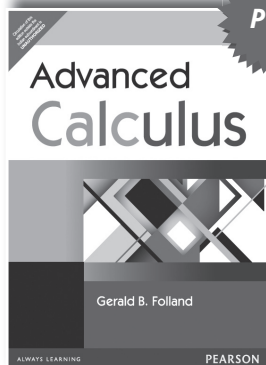
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| 2. Calculus of Vector-valued Functions | 7. Reduction Formulae                                     | Appendix B: L'Hôpital's Rule for Indeterminate Forms           |
| 3. Two-Dimensional Geometry            | 8. Application of Integral Calculus                       | Appendix C: Alternative Proof of Vector Triple Product Formula |
| 4. Three-Dimensional Geometry          | 9. Differential Equations of First Order and First Degree | Hints and Solutions to Exercises                               |
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|  | Answers to MCQ  | Index  |

### ABOUT THE AUTHOR

**Anindya Dey** is presently working as a Senior Assistant Professor in the Department of Mathematics, St. Xavier's College (Autonomous), Kolkata. He has been teaching at the undergraduate level for more than two decades primarily the topics like Differential Equations, Linear Algebra, Probability Theory, Vector Algebra & Vector Analysis, Mechanics and Special Theory of Relativity. He has so far authored two books, viz. Metric Spaces and Complex Analysis [New Academic Science, London, UK] and Differential Equations—A Linear algebra Approach [CRC Press]. Prof. Dey completed M.Sc. & M.Phil. in Applied Mathematics from the University of Kolkata and started his research career as CSIR Fellow in the Department of Applied Mathematics, C.U. but later on moved to Indian Statistical Institute, Kolkata. Quantum Mechanics and Supersymmetry are his areas of research interest. Presently he is working on Lie group theoretic ideas related to differential equations





POD

ISBN: 9788131768570

- A focus on calculus itself and its applications
- Numerous worked-out examples and exercises throughout
- A chapter on Fourier analysis

### CONTENTS

1. Setting the Stage.
2. Differential Calculus
3. The Implicit Function Theorem and Its Applications
4. Integral Calculus
5. Line and Surface Integrals; Vector Analysis
6. Infinite Series
7. Fourier Series
8. Fourier Series

## Advanced Calculus

 **Gerald B. Folland**

 **476** | © **2002**



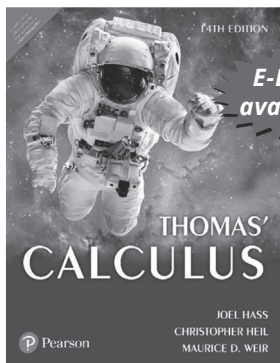
### ABOUT THE BOOK

This text presents a unified view of calculus in which theory and practice reinforce each other. It covers the theory and applications of derivatives (mostly partial), integrals, (mostly multiple or improper), and infinite series (mostly of functions rather than of numbers), at a deeper level than is found in the standard advanced calculus books.

### FEATURES

- Single and Multivariable Analysis equally balanced

## Thomas' Calculus, 14/e



E-Book available

ISBN: 9789353060411

### FEATURES

- **Strong exercise sets** feature a great breadth of problems—progressing from skills problems to applied and theoretical problems—to encourage students to think about and practice the concepts until they achieve mastery.
- **Complete and precise multivariable coverage** enhances the connections of multivariable ideas with their single-variable analogues studied earlier in the book.

 **Joel Hass | Christopher Heil | Maurice D. Weir**

 **1208** | © **2018**



### ABOUT THE BOOK

Thomas' Calculus, Fourteenth Edition, introduces students to the intrinsic beauty of calculus and the power of its applications. For more than half a century, this text has been revered for its clear and precise explanations, thoughtfully chosen examples, superior figures, and time-tested exercise sets.

## NEW TO THIS EDITION

- Updated graphics emphasize clear visualization and mathematical correctness.
- New examples and figures have been added throughout all chapters, based on user feedback.
- New types of homework exercises, including many geometric in nature, have been added to provide different perspectives and approaches to each topic.
- Short URLs have been added to the historical margin notes, allowing students to navigate directly to online information.
- New annotations within examples guide the student through the problem solution and emphasize that each step in a mathematical argument is rigorously justified.

## CONTENTS

1. Functions
  2. Limits and Continuity
  3. Derivatives
  4. Applications of Derivatives
  5. Integrals
  6. Applications of Definite Integrals
  7. Transcendental Functions
  8. Techniques of Integration
  9. First-Order Differential Equations
  10. Infinite Sequences and Series
  11. Parametric Equations and Polar Coordinates
  12. Vectors and the Geometry of Space
  13. Vector-Valued Functions and Motion in Space
  14. Partial Derivatives
  15. Multiple Integrals
  16. Integrals and Vector Fields
  17. Second-Order Differential Equations (Online)
- Appendices  
Answers to Odd-Numbered Exercises

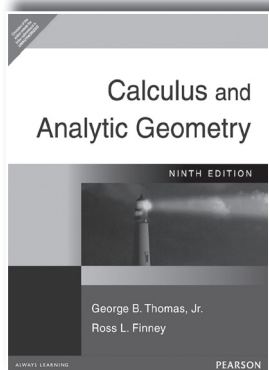
## ABOUT THE AUTHOR(S)

**George B. Thomas, Jr. (late)** of the Massachusetts Institute of Technology, was a professor of mathematics for thirty-eight years; he served as the executive officer of the department for ten years and as graduate registration officer for five years. Thomas held a spot on the board of governors of the Mathematical Association of America and on the executive committee of the mathematics division of the American Society for Engineering Education.

**Joel Hass** received his PhD from the University of California Berkeley. He is currently a professor of mathematics at the University of California Davis. He has coauthored widely used calculus texts as well as calculus study guides. He is currently on the editorial board of several publications, including the Notices of the American Mathematical Society.

**Christopher Heil** received his PhD from the University of Maryland. He is currently a professor of mathematics at the Georgia Institute of Technology.

**Maurice D. Weir (late)** of the the Naval Postgraduate School in Monterey, California was Professor Emeritus as a member of the Department of Applied Mathematics. He held a DA and MS from Carnegie-Mellon University and received his BS at Whitman College.



ISBN: 9788177583250

## Calculus & Analytical Geometry, 9/e

 **George B. Thomas Jr.**

 1264 | © 2006

### ABOUT THE BOOK

George Thomas' clear, precise calculus text with superior applications defined the modern-day, three-semester or four-quarter calculus course. The ninth edition of this proven text has been carefully revised to give students the solid base of material they will need to succeed in math, science, and engineering programs. This edition includes recent innovations in teaching and learning that involve technology, projects, and group work.

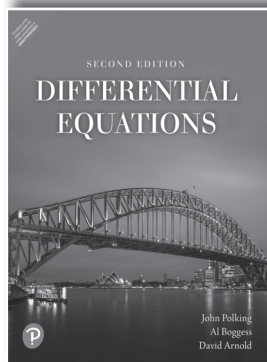


## FEATURES

- Exercises have been reorganized to facilitate assigning a subset of the material in a section.
- New Computer Algebra System (CAS) explorations and projects that require a CAS have been included.
- Technology Connection notes appear throughout the text suggesting experiments students might do with a grapher to supplement their understanding of given topic.

## CONTENTS

1. Preliminaries
  2. Limits and Continuity
  3. Derivatives
  4. Applications of Derivatives
  5. Integration
  6. Applications of Integrals
  7. Transcendental Functions
  8. Techniques of Integration
  9. Infinite Series
  10. Conic Sections, Parametrized Curves, and Polar Coordinates
  11. Vectors and Analytic Geometry in Space
  12. Vector-Valued Functions and Motion in Space
  13. Multivariable Functions and Partial Derivatives
  14. Multiple Integrals
  15. Integration in Vector Fields
-



ISBN: 9789353432270

- Strong systems approach.
- Novel modeling approach.
- Flexible use of technology.

## CONTENTS

Introduction to Differential Equations  
First-Order Equations  
Modeling and Applications  
Second-Order Equations  
The Laplace Transform  
Numerical Methods

## Differential Equations, 2/e

 John Polking | Al Boggess | David Arnold

 656 | © 2019



## ABOUT THE BOOK

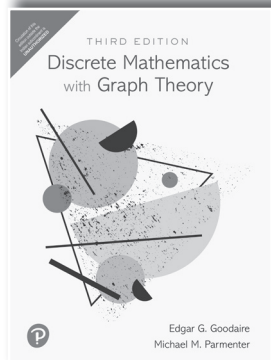
Combining traditional differential equation material with a modern qualitative and systems approach, this new edition continues to deliver flexibility of use and extensive problem sets. The 2nd Edition's refreshed presentation includes extensive new visuals, as well as updated exercises throughout.

## FEATURES

- Unique blend of traditional algebraic and modern qualitative geometric approaches.

Matrix Algebra  
An Introduction to Systems  
Linear Systems with Constant Coefficients  
Nonlinear Systems  
Series Solutions to Differential Equations

## Discrete Mathematics with Graph Theory, 3/e



ISBN: 9789353433017

 Edgar Goodaire | Michael Parmenter

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### ABOUT THE BOOK

Far more “user friendly” than the vast majority of similar books, this text is truly written in a friendly, conversational, humorous style with the “beginning” reader in mind. The pace is tight, the style is light, and the text emphasizes theorem proving throughout. The authors emphasize “Active Reading,” a skill vital to success in learning how to think mathematically and write clean, error-free programs.

### FEATURES

- A friendly, conversational, humorous style – Makes this top seller stimulating and engaging for the reader.
- Emphasis on writing and critical-thinking skills.
- More than 300 worked examples and 3500 exercises. The problem sets are carefully graded by level of difficulty.
- A FREE Student Solutions Manual is built into the back of the text.
- Topics in discrete math are used as a vehicle for teaching proofs.
- An unusually strong emphasis on graph theory, incorporating its coverage throughout six chapters.

### CONTENTS

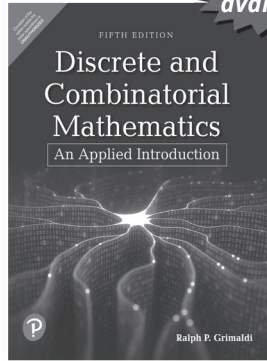
1. Logic
2. Sets and Relations
3. Functions
4. The Integers
5. Induction and Recursion
6. Principles of Counting
7. Permutations and Combinations
8. Algorithms
9. Graphs
10. Paths and Circuits
11. Applications of Paths and Circuits
12. Trees
13. Planar Graphs and Colorings
14. The Max Flow -- Min Cut Theorem

### ABOUT THE AUTHOR

**Edgar Goodaire** Honorary Research Professor (retired). PhD British Columbia, 1973 B.Sc. Toronto, 1969. CMS Distinguished Service Award, 2004.

---

# Discrete and Combinatorial Mathematics, 5/e



ISBN: 9789353433055



Ralph P. Grimaldi



1008 | © 2019



## ABOUT THE BOOK

This fifth edition continues to improve on the features that have made it the market leader. The text offers a flexible organization, enabling instructors to adapt the book to their particular courses. The book is both complete and careful, and it continues to maintain its emphasis on algorithms and applications. Excellent exercise sets allow students to perfect skills as they practice. This new edition continues to feature numerous computer science applications—making this the ideal text for preparing students for advanced study.

## FEATURES

- Enhanced mathematical approach with carefully thought out examples, including many examples with computer sciences applications.
- New material on cryptology, private-key cryptosystems and public-key RSA cryptosystems.
- Expanded treatment of discrete probability.
- Includes historical reviews and biographies that bring a human element to their assignments.
- Provides chapter summaries to allow students to review what they have learned.

## CONTENTS

### PART 1. FUNDAMENTALS OF DISCRETE MATHEMATICS.

1. Fundamental Principles of Counting.
2. Fundamentals of Logic.
3. Set Theory
4. Properties of the Integers: Mathematical Induction
5. Relations and Functions.
6. Languages: Finite State Machines.
7. Relations: The Second Time Around.

### PART 2. FURTHER TOPICS IN ENUMERATION.

8. The Principle of Inclusion and Exclusion.
9. Generating Functions.
10. Recurrence Relations.

### PART 3. GRAPH THEORY AND APPLICATIONS.

11. An Introduction to Graph Theory.
12. Trees.
13. Optimization and Matching

### PART 4. MODERN APPLIED ALGEBRA.

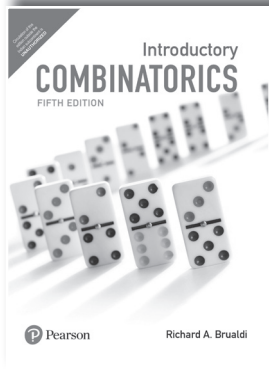
14. Rings and Modular Arithmetic
15. Boolean Algebra and Switching Functions.
16. Groups, Coding Theory, and Polya's Theory of Enumeration.
17. Finite Fields and Combinatorial Designs.

## ABOUT THE AUTHOR

Ralph Peter Grimaldi (born January 1943) is an American mathematician specializing in discrete mathematics who is a professor at Rose-Hulman Institute of Technology.

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## Introductory Combinatorics, 5/e



ISBN: 9789353433062

 **Richard A. Brualdi**

 **624** | © **2019**

### ABOUT THE BOOK

This trusted best-seller covers the key combinatorial ideas—including the pigeon-hole principle, counting techniques, permutations and combinations, Pólya counting, binomial coefficients, inclusion-exclusion principle, generating functions and recurrence relations, combinatorial structures (matchings, designs, graphs), and flows in networks. The 5th Edition incorporates feedback from users to the exposition throughout and adds a wealth of new exercises.

### FEATURES

- **Covers a wide range of topics:**
  - Dilworth's Theorem
  - Partitions of integers
  - Counting sequences and generating functions
  - Extensive graph theory coverage
- **A clear and accessible presentation**, written from the student's perspective, facilitates understanding of basic concepts and principles.
- **An excellent treatment of Pólya's Counting Theorem** that does not assume students have studied group theory.
- **Many worked examples** illustrate methods used.

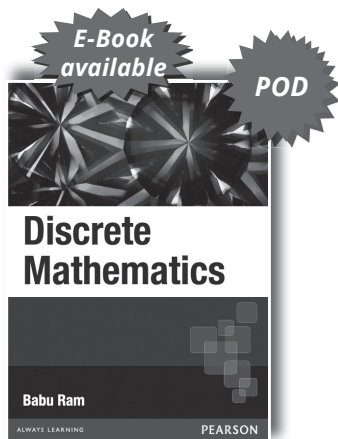
### CONTENTS

1. What is Combinatorics?
2. The Pigeonhole Principle
3. Permutations and Combinations
4. Generating Permutations and Combinations
5. The Binomial Coefficients
6. The Inclusion-Exclusion Principle and Applications
7. Recurrence Relations and Generating Functions
8. Special Counting Sequences
9. Systems of Distinct Representatives
10. Combinatorial Designs
11. Introduction to Graph Theory
12. More on Graph Theory
13. Digraphs and Networks
14. Pólya Counting

### ABOUT THE AUTHOR

Richard A. Brualdi is Bascom Professor of Mathematics, Emeritus at the University of Wisconsin-Madison. He served as Chair of the Department of Mathematics from 1993–1999.

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ISBN: 9788131733103

## Discrete Mathematics

 Babu Ram

 584 | © 2011



### ABOUT THE BOOK

*Discrete Mathematics* is an integral part of any undergraduate as well as post graduate courses in Computer Science and Mathematics. The syllabi of all these courses have been studied in depth and utmost care has been taken to ensure that all the essential topics in discrete structures are adequately emphasized. The book will enable the students to develop the requisite computational skills needed in software engineering.

### FEATURES

- C Programs of important algorithms
- Extensive coverage of Boolean Algebra, Algebraic Structures and Graph Theory
- 550 Solved examples and 170 practice problems with hints/answers

### CONTENTS

- |                                  |                         |                            |
|----------------------------------|-------------------------|----------------------------|
| 1. Sets, Relations and Functions | 5. Algebraic Structures | 8. Graphs                  |
| 2. Counting                      | 6. Lattices             | 9. Finite State Automata   |
| 3. Recurrence Relations          | 7. Boolean Algebra      | 10. Languages and Grammars |
| 4. Logic                         |                         |                            |

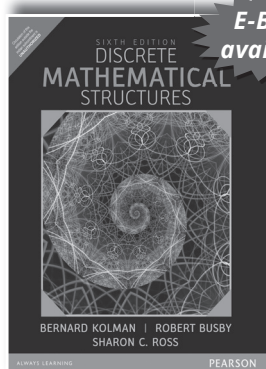
### ABOUT THE AUTHOR(S)

**Babu Ram** received his Ph.D. degree in mathematics in 1973 from Kurukshetra University, Kurukshetra, India. He was formerly Professor of Mathematics and Dean, Faculty of Physical Sciences at Maharshi Dayanand University, Rohtak and has been teaching mathematics for the past 36 years. A member of Indian Mathematical Society and the American Mathematical Society, Professor Babu Ram has published 42 research papers in Real and Functional Analysis in international journals of repute. He is on the board of reviewers of both American Mathematical Reviews and Zentralblatt fur Mathematik und ihre Grengebiete, Berlin. Presently, he is working as Director MCA at Manav Rachna International University, Faridabad.

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## Discrete Mathematical Structures, 6/e



E-Book  
available

ISBN: 9789332549593



Bernard Kolman | Robert Busby | Sharon C. Ross



552 | © 2015

### ABOUT THE BOOK

*Discrete Mathematical Structures*, Sixth Edition, offers a clear and concise presentation of the fundamental concepts of discrete mathematics. Ideal for a one-semester introductory course, this text contains more genuine computer science applications than any other text in the field.

This book is written at an appropriate level for a wide variety of majors and non-majors, and assumes a college algebra course as a prerequisite.

### FEATURES

- The focus on computer science prepares students for future computer science careers.
- The emphasis on proof lays the foundation for mathematical thinking.
- Clear organization of topics prevents students from being overwhelmed. The authors treat relations and digraphs as two aspects of the same fundamental idea, which is then used as the basis of virtually all the concepts introduced in the book.
- Vignettes of mathematical history open each chapter, providing students with a practical background of how these ideas were developed.
- Additional number theory coverage provides more information on the properties of integers, including base  $n$  representations, and gives more contexts for isomorphism.
- Cryptology is explored throughout the book, introducing students to this exciting field.
- Coverage of coding provides students with a full picture of all of its aspects, including efficiency, effectiveness, and security. A set of coding exercises for each chapter is also included in Appendix C.
- Exercises emphasize multiple representations of concepts, and provide practice on reading and writing mathematical proofs.
- Experiments provide opportunities for in-depth exploration and discovery, as well as for writing and for working in groups. Topics include weighted voting systems, Petri nets, Catalan numbers, and others.
- End-of-chapter material includes Tips for Proofs, a summary of Key Ideas, and a Self-Test, which contains a set of conceptual review questions to help students identify and synthesize the main ideas of each chapter.

### CONTENTS

- |                           |                                   |   |
|---------------------------|-----------------------------------|---|
| 1. Fundamentals           | 5. Functions                      | 9. Semigroups and Groups                |
| 2. Logic                  | 6. Order Relations and Structures | 10. Groups and Coding                   |
| 3. Counting               | 7. Trees                          | 11. Languages and Finite-State Machines |
| 4. Relations and Digraphs | 8. Topics in Graph Theory         |   |

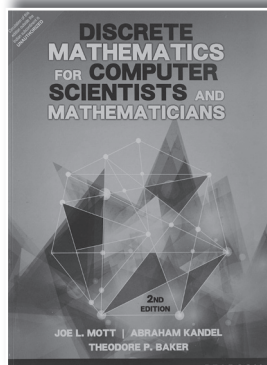
### ABOUT THE AUTHOR(S)

**Bernard Kolman** received his BS in mathematics and physics from Brooklyn College in 1954, his ScM from Brown University in 1956, and his PhD from the University of Pennsylvania in 1965, all in mathematics. He has worked as a mathematician for the US Navy and IBM. He has been a member of the mathematics department at Drexel University since 1964, and has served as Acting Head of the department. His research activities have included Lie algebra and perations research. He belongs to a number of professional associations and is a member of Phi Beta Kappa, Pi Mu Epsilon, and Sigma Xi.

**Robert C. Busby** received his BS in physics from Drexel University in 1963, his AM in 1964 and PhD in 1966, both in mathematics from the University of Pennsylvania. He has served as a faculty member of the mathematics department at Drexel since 1969. He has consulted in applied mathematics and industry and government, including three years as a consultant to the Office of Emergency Preparedness, Executive Office of the President, specializing in applications of mathematics to economic problems. He has written a number of books and research papers on operator algebra, group representations, operator continued fractions, and the applications of probability and statistics to mathematical demography.

Sharon Cutler Ross received a SB in mathematics from the Massachusetts Institute of Technology in 1965, an MAT in secondary mathematics from Harvard University in 1966, and a PhD in mathematics from Emory University in 1976. She has taught junior high, high school, and college mathematics, and has taught computer science at the collegiate level. She has been a member of the mathematics department at DeKalb College. Her current professional interests are in undergraduate mathematics education and alternative forms of assessment. Her interests and associations include the Mathematical Association of America, the American Mathematical Association of Two-Year Colleges, and UME Trends. She is a member of Sigma Xi and other organizations.

## Discrete Mathematics for Computer Scientists, 2/e



ISBN: 9789332550490



Joe L Mott | Abraham Kandel



768 | © 2015

### ABOUT THE BOOK

This is a lucidly written fine-tuned introduction to discrete mathematics. It is eminently suited for students pursuing BCA, MCA and B.E./B.Tech courses. Considering the importance of the subject, quite a number of universities have sought to introduce discrete mathematics as a core subject in the engineering curriculum.

### FEATURES

■ Comprehensive discussions on graph theory, mathematical induction, Boolean algebras, logic and other proof techniques and recurrence relations have been

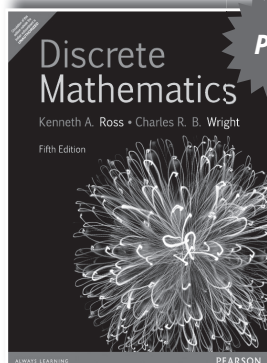
dealt with.

- Gives good insights into graphs as a modeling tool.
- Gives better understanding of computer solutions of differential equations.
- Many worked out examples and solutions follow each section.

### CONTENTS

- |                            |                          |  |
|----------------------------|--------------------------|--|
| ● Acknowledgments          | ● Recurrence Relations   | ● Network Flows                                  |
| ● A Note to the Reader     | ● Relations and Digraphs | ● Representation and Manipulation of Imprecision |
| ● Foundations              | ● Graphs                 | ● Bibliography                                   |
| ● Elementary Combinatorics | ● Boolean Algebras       |  |

## Discrete Mathematics, 5/e



ISBN: 9788131790618



Kenneth A Ross | Charles R. Wright



635 | © 2012

### ABOUT THE BOOK

Revised for extra clarity, the distinguishing characteristic of Ross and Wright is a sound mathematical treatment that increases smoothly in sophistication. The text presents utility-grade discrete math tools so students can understand them, use them, and move on to more advanced mathematical topics

## FEATURES

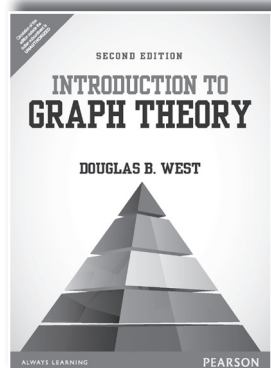
- NEW - Over 270 supplementary exercises All with answers
- NEW - Full chapter on discrete probability
- NEW - Chapter on algebraic structures
- Comprehensive coverage of logic and proofs
- Full chapter on recursion

## CONTENTS

1. Sets, Sequences, and Functions
2. Elementary Logic
3. Relations
4. Induction and Recursion
5. Counting
6. Introduction to Graphs and Trees
7. Recursion, Trees and Algorithms
8. Digraphs
9. Discrete Probability
10. Boolean Algebra
11. More on Relations
12. Algebraic Structures
13. Predicate Calculus and Infinite Sets

## ABOUT THE AUTHOR(S)

Kenneth A. Ross, University of Oregon  
Charles R. Wright, University of Oregon



ISBN: 9789332549654

## Introduction to Graph Theory, 2/e

 Douglas B. West

 470 | © 2015



## ABOUT THE BOOK

For undergraduate or graduate courses in Graph Theory in departments of mathematics or computer science.

This text offers a comprehensive and coherent introduction to the fundamental topics of graph theory. It includes basic algorithms and emphasizes the understanding and writing of proofs about graphs. Thought-provoking examples and exercises develop a thorough understanding of the structure of graphs and the techniques used to analyze problems. The first seven chapters form the basic course, with advanced material in Chapter 8.

## FEATURES

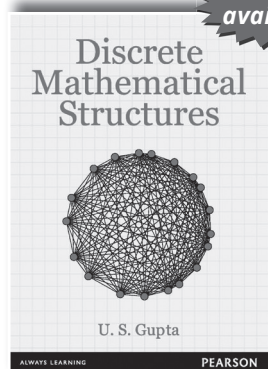
- NEW - Appendix of Mathematical Background—Appendix A presents background material on logical statements, basic set theory, equivalence relations, and elementary counting.
- Makes review material easily accessible for beginning students (Chapter 1 still discusses central proof techniques).
- NEW - Expanded and improved selection of exercises—Exercises have been added, especially easier exercises, and many exercises have been further clarified.
- Enlarged selection of easier exercises provides greater encouragement for beginning students and makes the material useful for a broader range of students.
- NEW - Reorganization of material. Some material has been reorganized to provide a smoother development and clearer focus on essential material with optional material clearly designated or removed.
- Facilitates more efficient learning by aiding instructors in designing courses and students in seeing what is important.
- NEW - Definitions more prominent. Terms being defined are in bold type and most important definitions occur in numbered items.
- Makes definitions easier for students to find.
- NEW - Hints for selected exercises—More hints have been added as Appendix C.
- Allows students to learn at their own pace; weaker students have more opportunity to be successful; stronger students have more opportunity to be stimulated.

- Logical organization—Concepts are introduced as needed, achieving a gradual increase in intellectual difficulty.
- Allows students to find fundamental results in the early sections of chapters and to master elementary concepts in preparation for later applications.
- Additional topics—Final chapter is a bridge to advanced topics.
- Provides supplementary reading for good students and flexibility in advanced courses.
- Over 400 illustrations.
- Allows students to check their understanding of definitions and of steps in proofs.
- Over 1200 exercises—Ranging from relatively straightforward applications of ideas in the text to subtle problems requiring some ingenuity.
- Helps students to understand the ideas of the course and to improve their presentation of coherent arguments.
- Graduation of exercises—Denotes easier exercises by (-), harder by (+), and particularly valuable or instinctive exercises by (!).
- Aids instructor in selecting appropriate exercises and students in practicing for tests.

## CONTENTS

- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. Fundamental Concepts.<br/>What Is a Graph? Paths, Cycles, and Trails. Vertex Degrees and Counting. Directed Graphs.</li> <li>2. Trees and Distance.<br/>Basic Properties. Spanning Trees and Enumeration. Optimization and Trees.</li> <li>3. Matchings and Factors.<br/>Matchings and Covers. Algorithms and Applications. Matchings in General Graphs.</li> <li>4. Connectivity and Paths.<br/>Cuts and Connectivity. <math>k</math>-connected Graphs. Network Flow Problems.</li> <li>5. Coloring of Graphs.<br/>Vertex Colorings and Upper Bounds. Structure of <math>k</math>-chromatic Graphs. Enumerative Aspects.</li> <li>6. Planar Graphs.</li> </ol> | <ol style="list-style-type: none"> <li>7. Edges and Cycles.<br/>Line Graphs and Edge-Coloring. Hamiltonian Cycles. Planarity, Coloring, and Cycles.</li> <li>8. Additional Topics (Optional).<br/>Perfect Graphs. Matroids. Ramsey Theory. More Extremal Problems. Random Graphs. Eigenvalues of Graphs.</li> </ol> <p>Appendix A: Mathematical Background.<br/>Appendix B: Optimization and Complexity.<br/>Appendix C: Hints for Selected Exercises.<br/>Appendix D: Glossary of Terms.<br/>Appendix E: Supplemental Reading.<br/>Appendix F: References.</p> |
|---|---|

## Discrete Mathematical Structures



ISBN: 9789332521391

 **U.S Gupta**

 **576** | © **2014**

### ABOUT THE BOOK

*Discrete Mathematical Structures* provides comprehensive, reasonably rigorous and simple explanation of the concepts with the help of numerous applications from computer science and engineering.

Every chapter is equipped with a good number of solved examples that elucidates the definitions and theorems discussed. Chapter-end exercises are graded, with the easier ones in the beginning and then the complex ones, to help students for easy solving.

### FEATURES

- Over 250 unsolved questions
- Around 400 solved examples

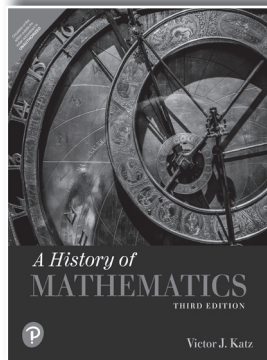
### CONTENTS

1. Set Theory
2. Relations and Digraphs
3. Functions
4. Mathematical Logic and Methods of Proofs
5. Combinatorics
6. Recurrence Relations and Generating Functions
7. Algebraic Structures
8. Ordered Sets and Lattices
9. Boolean Algebra
10. Graph Theory
11. Trees
12. Vector Spaces

### ABOUT THE AUTHOR

**Uma Shanker Gupta** joined the department of mathematics, the University of Roorkee (presently IIT-Roorkee), in 1967, after teaching for five years at Ewing Christian Degree College, Allahabad. He was awarded PhD (Mathematics) by the University of Roorkee in 1971. He has been a reviewer of many International journals like Journal of Applied Mechanics, Journal of Sound and Vibration to name a few. He became EMERITUS FELLOW in 2004 and held this position till 2006.

## A History of Mathematics, 3/e



ISBN: 9789353433000

 Victor J. Katz

 992 | © 2019



### ABOUT THE BOOK

*A History of Mathematics, 3rd Edition*, provides students with a solid background in the history of mathematics and focuses on the most important topics for today's elementary, high school, and college curricula. Students will gain a deeper understanding of mathematical concepts in their historical context, and future teachers will find this book a valuable resource in developing lesson plans based on the history of each topic.

### FEATURES

- **The flexible presentation** organizes the book by chronological period and then by topic.
- **Discussions of the important textbooks** of major time periods show students how topics were historically treated, allowing students to draw connections to modern approaches.
- **A global perspective** integrates non-Western coverage, including contributions from Chinese, Indian, and Islamic mathematicians. An additional chapter discusses the mathematical achievements of early Africa, America, and Asia.
- **Chapter openers** include a vignette and quotation to add motivation and human interest.
- **Focus essays** are boxed features that are set apart from the main narrative of the text for easy reference.
- **A chronology of major mathematicians** at the end of every chapter gives an overview of important individuals and their contribution to the field of mathematics.

### CONTENTS

1. Egypt and Mesopotamia
2. The Beginnings of Mathematics in Greece
3. Euclid
4. Archimedes and Apollonius
5. Mathematical Methods in Hellenistic Times
6. The Final Chapter of Greek Mathematics

#### Part II. Medieval Mathematics

7. Ancient and Medieval China
8. Ancient and Medieval India
9. The Mathematics of Islam
10. Medieval Europe
11. Mathematics Elsewhere

#### Part III. Early Modern Mathematics

12. Algebra in the Renaissance
13. Mathematical Methods in the Renaissance
14. Geometry, Algebra and Probability in the Seventeenth Century

15. The Beginnings of Calculus
16. Newton and Leibniz

#### Part IV. Modern Mathematics

17. Analysis in the Eighteenth Century
18. Probability and Statistics in the Eighteenth Century
19. Algebra and Number Theory in the Eighteenth Century
20. Geometry in the Eighteenth Century
21. Algebra and Number Theory in the Nineteenth Century
22. Analysis in the Nineteenth Century
23. Probability and Statistics in the Nineteenth Century
24. Geometry in the Nineteenth Century
25. Aspects of the Twentieth Century

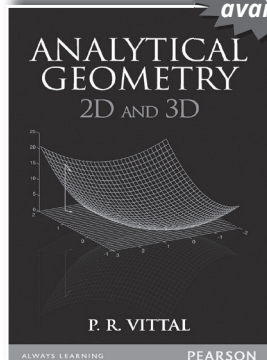
### ABOUT THE AUTHOR

Victor J. Katz received his PhD in mathematics from Brandeis University in 1968 and has been Professor of Mathematics at the University of the District of Columbia for many years.

Analytical Geometry: 2D and 3D

 P R Vittal

 752 | © 2013



ISBN: 9788131773604

**ABOUT THE BOOK**

Designed to meet the requirements of UG students, the book deals with the theoretical as well as the practical aspects of the subject. Equal emphasis has been given to both 2D as well as 3D geometry. The book follows a systematic approach with adequate examples for better understanding of the concepts.

**CONTENTS**

**PART I**

1. Coordinate Geometry
2. Straight Line
3. Pair of straight lines
4. Circle
5. System of circles
6. Parabola
7. Ellipse
8. Hyperbola

9. Polar co-ordinates
10. Tracing of Curves

**PART II**

11. Three dimension
12. Plane
13. Straight line
14. Sphere
15. Cone
16. Cylinder

**ABOUT THE AUTHOR**

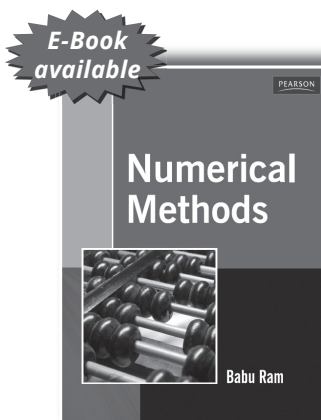
P. R. Vittal was a postgraduate professor of mathematics at Ramakrishna Mission Vivekananda College, Chennai, from where he retired as principal in 1996. His assignments as visiting professor took him to Western Carolina University, USA. Currently, Vittal is a visiting professor at the Department of Statistics, University of Madras; The Institute of Chartered Accountants of India, Chennai; the Institute for Technology and Management, Chennai; and National Management School, Chennai, besides being a research guide for management science at BITS Pilani.



## Numerical Methods

 Babu Ram

 520 | © 2010



ISBN: 9788131732212

### ABOUT THE BOOK

*Numerical Methods* is a mathematical tool used by engineers and mathematicians to do scientific calculations. It is used to find solutions to applied problems where ordinary analytical methods fail. This book is intended to serve for the needs of courses in *Numerical Methods* at the Bachelors' and Masters' levels at various universities.

### FEATURES

- Concise and easy-to-understand treatment of concepts
- Most of the numerical methods have been described technically along with the convergence and error propagation
- 260 solved examples
- 160 practice problems
- Error analysis using various methods
- C programs of important numerical methods

### CONTENTS

1. Preliminaries
2. Non-Linear Equations
3. Linear Systems of Equations
4. Eigenvalues and Eigenvectors
5. Finite Differences and Interpolation
6. Curve Fitting
7. Numerical Differentiation
8. Numerical Quadrature
9. Difference Equations
10. Ordinary Differential Equations
11. Partial Differential Equations
12. Elements of C Language

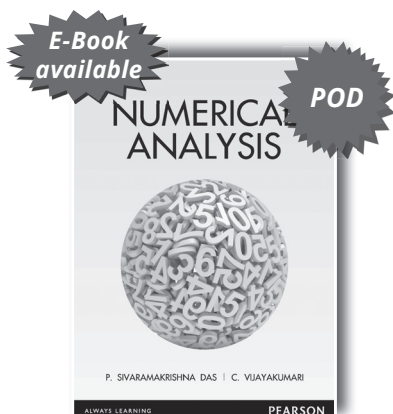
### ABOUT THE AUTHOR

Babu Ram received his Ph.D. degree in Mathematics in 1973 from Kurukshetra University, Kurukshetra, India. He retired from Maharshi Dayanand University, Rohtak in 2006 as Professor of Mathematics and Dean, Faculty of Physical Sciences. Currently, he is Programme Director (MCA) at Manav Rachna International University, Faridabad (Haryana). He has published 42 research papers in Real and Functional Analysis in international journals of repute.

## Numerical Analysis

 Sivaramakrishna Das | Vijayakumari

 768 | © 2014



ISBN: 9788131776469

### ABOUT THE BOOK

A text book designed exclusively for the undergraduate students. With a complete presentation on theoretical and numerical derivations supported with rich pedagogy for practice. All chapters begin with theoretical presentation emphasizing the practical computation which addresses the accurate approximation. Subsequently, the book provides a detailed explanation on Errors in Numerical Computation,



Algebraic and Transcendental Equations, Solution of Linear System of Equation, Curve Fitting, Initial value problem for ordinary differential equation, Boundary value problems of second order partial differential equation and Solution of difference equation with constant coefficient.

### FEATURES

- An exclusive coverage on Boundary value problems of second order partial differential equation and solution of difference equation with constant coefficient
- Over 200 line diagrams
- 400 solved problems
- 250 unsolved problems for practice.

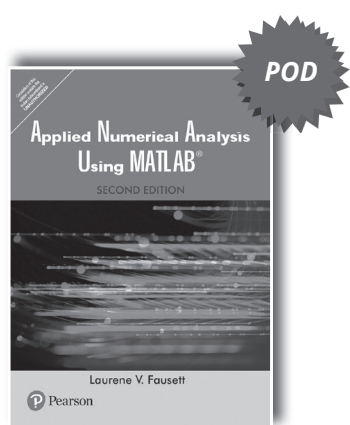
### CONTENTS

1. Errors in Numerical Computations
2. Solution of Algebraic and Transcendental Equations
3. Polynomial Interpolation
4. Inverse Interpolation
5. Numerical Differentiation
6. Numerical Integration
7. Curve Fitting
8. Initial value Problems for Ordinary Differential Equations
9. Boundary Value problems in Ordinary and Partial Differential Equation
10. Differential Equations

### ABOUT THE AUTHOR(S)

**P. Sivaramakrishna Das** started his career as Assistant Professor of Mathematics at Ramakrishna Mission Vivekananda College, Chennai, his alma mater, and retired as Professor and Head of the Department of Mathematics from the same college after an illustrious career spanning 36 years. Currently, he is Professor of Mathematics, Department of Science and Humanities, K.C.G. College of Technology, Chennai.

**C. Vijayakumari** began her career as Assistant Professor of Mathematics at Government Arts College for Women, Thanjavur, and has taught at various government arts and science colleges across Tamil Nadu before retiring as Professor of Mathematics, Queen Mary's College, Chennai, with 40 years of teaching experience behind her.



ISBN: 9788131728536

## Applied Numerical Analysis Using MATLAB, 2/e

 **Laurene V. Fausett**

 **688 | © 2009**

### ABOUT THE BOOK

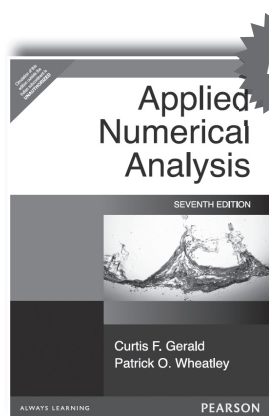
This text is appropriate for undergraduate courses on numerical methods and numerical analysis found in engineering, mathematics & computer science departments. Each chapter uses introductory problems from specific applications. These easy-to-understand problems clarify for the reader the need for a particular mathematical technique. Numerical techniques are explained with an emphasis on why they work.

### FEATURES

- Full-page overview for each chapter “ Includes two applications to introduce each chapter (except the first introductory chapter)
- End-of-chapter Beyond the Basics or Further Topics Introduce more advanced methods, often including those used by MATLAB and other professionally developed software packages.
- Chapter Wrap-Up “ Includes a summary of the formulas for the basic methods presented in the chapter, suggestions for further reading, and several types of exercises.
- Practice the Techniques problems “ Present fairly straightforward problems that encourage practice by hand or verification of simple MATLAB programs.

## CONTENTS

1. Foundations
2. Functions of One Variable
3. Solving Linear Systems: Direct Methods
4. LU and QR Factorization
5. Eigenvalues and Eigenvectors
6. Solving Linear Systems: Iterative Methods
7. Nonlinear Functions of Several Variables
8. Interpolation
9. Approximation
10. Fourier Methods
11. Numerical Differentiation and Integration
12. Ordinary Differential Equations: Fundamentals
13. ODE: Systems, Stiffness, Stability
14. ODE: Boundary-Value Problems
15. Partial Differential Equations



ISBN: 9788131717400

## Applied Numerical Analysis, 7/e



Curtis F. Gerald



624 | © 2007

### ABOUT THE BOOK

The seventh edition of this classic text has retained the features that make it popular, while updating its treatment and inclusion of Computer Algebra Systems and Programming Languages. The exercise sets include additional challenging problems and projects which show practical applications of the material. Also, sections which discuss the use of computer algebra systems such as Maple®, Mathematica®, and MATLAB®, facilitate the integration of technology in the course. Furthermore, the text incorporates programming material in both FORTRAN and C. The breadth of topics, such as partial differential equations, systems of nonlinear equations, and matrix algebra, provide comprehensive and flexible, coverage of all aspects of numerical analysis.

### FEATURES

- Applied problems and applications emphasize real applications not detailed mathematical theorems
- Computer programs in either Fortran 90 or C are given at the conclusion of each chapter.
- Treats Linear systems before non-linear systems.
- The pace of topic presentation is appropriate for the audience.
- Excellent treatment of parallel processing.

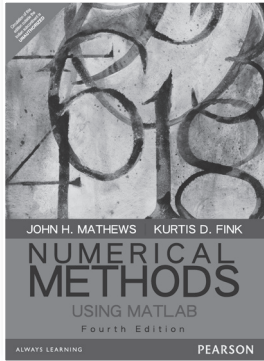
### CONTENTS

1. Solving Nonlinear Equations.
2. Solving Sets of Equations.
3. Interpolation and Curve Fitting.
4. Approximation of Functions.
5. Numerical Differentiation and Integration.
6. Numerical Solution of Ordinary Differential Equations.
7. Optimization.
8. Partial Differential Equations.
9. Finite Element Analysis.

## Numerical Methods Using MATLAB, 4/e

 John H. Mathews | Kurtis K. Fink

 696 | © 2015



ISBN: 9789332549357

### ABOUT THE BOOK

This book provides a fundamental introduction to numerical analysis for undergraduate students in the areas of mathematics, computer science, physical sciences, and engineering. Knowledge of calculus is assumed.

### FEATURES

- NEW - Expanded emphasis on analysis of competing methods and issues of error.
- NEW - Rewritten chapter on numerical optimization.
- NEW - New topics for minimization of  $z = f(x,y)$  are included.
- NEW - Projects for undergraduate library research experience have been added.
- Explicit use of the software MATLAB is offered.
- Each numerical method is presented in a self-contained format.
- Balance of theory and application.
- A variety of problems to sharpen students skills with extensive problem sets with a wide variety of activities.
- A wealth of tables and graphs which illustrates computer calculations in examples making the resulting numerical approximations easier to interpret.

### CONTENTS

1. Preliminaries.
  2. The Solution of Nonlinear Equations  $f(x) = 0$ .
  3. The Solution of Linear Systems  $AX = B$ .
  4. Interpolation and Polynomial Approximation.
  5. Curve Fitting.
  6. Numerical Differentiation.
  7. Numerical Integration.
  8. Numerical Optimization.
  9. Solution of Differential Equations.
  10. Solution of Partial Differential Equations.
  11. Eigenvalues and Eigenvectors.
- Appendix: An Introduction to MATLAB.  
Answers to Selected Exercises.

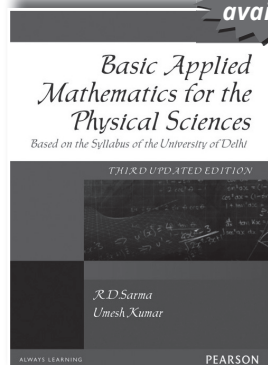
### ABOUT THE AUTHOR(S)

John H. Mathews, *California State University, Fullerton*  
Kurtis K. Fink, *Northwest Missouri State University*

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## Basic Applied Mathematics for the Physical Sciences, 3rd updated edition: Based on the syllabus of the University of Delhi, 3/e

E-Book  
available



ISBN: 9788131787823



R. D. Sarma | Umesh Kumar



440 | © 2012

### ABOUT THE BOOK

*Basic Applied Mathematics for the Physical Sciences* offers an introductory course in mathematics for the undergraduate students of physical sciences and applied physical sciences in the University of Delhi. Well structured into three parts, this book presents an in-depth study of matrices, calculus and complex numbers. It provides a perfect blend of theoretical principles and numerical problems to help students enhance their understanding of mathematical concepts and their applications. A student-friendly approach and an easy-paced treatment of all relevant topics make this book useful for students of mathematics.

### FEATURES

- Completely covers the semester-wise revised syllabus of the University of Delhi
- Includes the University of Delhi's solved question papers for the years 2010-11 and 2011-12
- Mathematical concepts explained using illustrative examples, diagrams and problems from various domains of science
- More than 350 solved examples interspersed in the text
- 700 practice problems
- Statistical, logarithmic and exponential tables provided, making the text completely self-contained

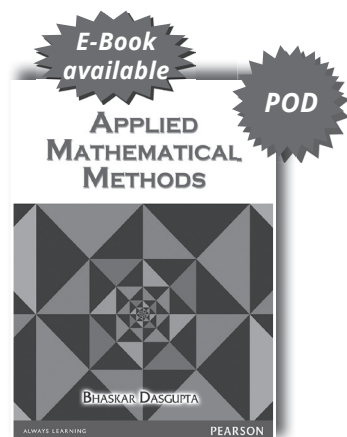
### CONTENTS

1. Matrices
2. Vectors in  $R^2$  and  $R^3$
3. Linear Transformations
4. Eigenvalues and Eigenvectors
5. Sequences
6. Functions and Their Graphs
7. Differential Equations in Mathematical Modelling
8. Successive Differentiation
9. Polynomial Approximation of Functions
10. Functions of Two Variables
11. Geometry of Complex Numbers
12. De Moivre's Theorem

### ABOUT THE AUTHOR(S)

**R. D. Sarma** is an associate professor in the Department of Mathematics at Rajdhani College, New Delhi. He has over 19 years of teaching experience at the undergraduate and postgraduate levels. He has published 28 research papers in various international journals and has worked on several research projects under the UGC and CSIR. His primary areas of interest are fuzzy set theory and topology. He has attended several international conferences and has been involved in guiding students for their Ph.D. degrees. He has also worked as an associate professor in mathematics in the Eritrea Institute of Technology, under the aegis of the Ministry of Education, Eritrea.

**Umesh Kumar** is an assistant professor in the Department of Mathematics at Rajdhani College, New Delhi. He is an active member of the Mathematical Association of India and a life member of the Indian Mathematical Society and Indian Science Congress Association. His area of research is topology. He was recently awarded 'The Worshipful Company of International Bankers' Prize' for securing the first position in M.Sc. (Financial Mathematics) from King's College, London. Presently, he is deputed as a faculty member in the Cluster Innovation Centre, University of Delhi.



ISBN: 9788131700686

## Applied Mathematical Methods

 **Bhaskar Dasgupta**

 524 | © 2006




### ABOUT THE BOOK

This book covers the material vital for research in today's world and can be covered in a regular semester course. It is the consolidation of the efforts of teaching the compulsory first semester post-graduate applied mathematics course at the Department of Mechanical Engineering at IIT Kanpur in two successive years.

### CONTENTS

1. Preliminary Background
2. Matrices and Linear Transformations
3. Operational Fundamentals of Linear Algebra
4. Systems of Linear Equations
5. Gauss Elimination Family of Methods
6. Special Systems and Special Methods
7. Numerical Aspects in Linear Systems
8. Eigenvalues and Eigenvectors
9. Diagonalization and Similarity Transformations
10. Jacobi and Givens Rotation Methods
11. Householder Transformation and Tridiagonal Matrices
12. QR Decomposition Method
13. Eigenvalue Problem of General Matrices
14. Singular Value Decomposition
15. Vector Spaces: Fundamental Concepts\*
16. Topics in Multivariate Calculus
17. Vector Analysis: Curves and Surfaces
18. Scalar and Vector Fields
19. Polynomial Equations
20. Solution of Nonlinear Equations and Systems
21. Optimization: Introduction
22. Multivariate Optimization
23. Methods of Nonlinear Optimization\*
24. Constrained Optimization
25. Linear and Quadratic Programming Problems\*
26. Interpolation and Approximation
27. Basic Methods of Numerical Integration
28. Advanced Topics in Numerical Integration\*
29. Numerical Solution of Ordinary Differential Equations
30. ODE Solutions: Advanced Issues
31. Existence and Uniqueness Theory
32. First Order Ordinary Differential Equations
33. Second Order Linear Homogeneous ODE's
34. Second Order Linear Non-Homogeneous ODE's
35. Higher Order Linear ODE's
36. Laplace Transforms
37. ODE Systems

- 
38. Stability of Dynamic Systems
  39. Series Solutions and Special Functions
  40. Sturm-Liouville Theory
  41. Fourier Series and Integrals
  42. Fourier Transforms
  43. Minimax Approximation\*
  44. Partial Differential Equations
  45. Analytic Functions
  46. Integrals in the Complex Plane
  47. Singularities of Complex Functions
  48. Variational Calculus\*

### **ABOUT THE AUTHOR**

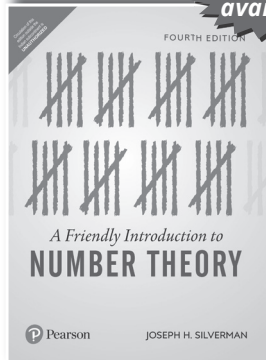
Bhaskar Dasgupta is associate professor in the Department of Mechanical Engineering at Indian Institute of Technology Kanpur. He received his doctorate from the Indian Institute of Science, Bangalore, India in 1997. His ever-expanding research interests include topics in robotics such as serial and parallel manipulators, and motion planning methods; as well as nonlinear optimization, domain mapping, geometric modelling and protein docking. In his spare time, he takes a zealous interest in languages, literature, history and philosophy.

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## A Friendly Introduction to Number Theory, 4/e

 **Joseph H Silverman**

 **424** |  **2019**



**E-Book available**

**ISBN: 9789353433079**

### ABOUT THE BOOK


A Friendly Introduction to Number Theory, 4th Edition is designed to introduce students to the overall themes and methodology of mathematics through the detailed study of one particular facet—number theory. Starting with nothing more than basic high school algebra, students are gradually led to the point of actively performing mathematical research while getting a glimpse of current mathematical frontiers. The writing is appropriate for the undergraduate audience and includes many numerical examples, which are analyzed for patterns and used to make conjectures. Emphasis is on the methods used for proving theorems rather than on specific results.

### FEATURES

- 50 short chapters provide flexibility and options for instructors and students. A flowchart of chapter dependencies is included in this edition.
- Five basic steps are emphasized throughout the text to help readers develop a robust thought process:
  - Experimentation
  - Pattern recognition
  - Hypothesis formation
  - Hypothesis testing
  - Formal proof
- RSA cryptosystem, elliptic curves, and Fermat's Last Theorem are featured, showing the real-life applications of mathematics.

### CONTENTS

1. What Is Number Theory?
2. Pythagorean Triples
3. Pythagorean Triples and the Unit Circle
4. Sums of Higher Powers and Fermat's Last Theorem
5. Divisibility and the Greatest Common Divisor
6. Linear Equations and the Greatest Common Divisor
7. Factorization and the Fundamental Theorem of Arithmetic
8. Congruences
9. Congruences, Powers, and Fermat's Little Theorem
10. Congruences, Powers, and Euler's Formula
11. Euler's Phi Function and the Chinese Remainder Theorem
12. Prime Numbers
13. Counting Primes
14. Mersenne Primes
15. Mersenne Primes and Perfect Numbers
16. Powers Modulo  $m$  and Successive Squaring
17. Computing  $k^{\text{th}}$  Roots Modulo  $m$
18. Powers, Roots, and "Unbreakable" Codes
19. Primality Testing and Carmichael Numbers
20. Squares Modulo  $p$
21. Is  $-1$  a Square Modulo  $p$ ? Is  $2$ ?
22. Quadratic Reciprocity
23. Proof of Quadratic Reciprocity
24. Which Primes Are Sums of Two Squares?

- 
25. Which Numbers Are Sums of Two Squares?
  26. As Easy as One, Two, Three
  27. Euler's Phi Function and Sums of Divisors
  28. Powers Modulo  $p$  and Primitive Roots
  29. Primitive Roots and Indices
  30. The Equation  $X^4 + Y^4 = Z^4$
  31. Square-Triangular Numbers Revisited
  32. Pell's Equation
  33. Diophantine Approximation
  34. Diophantine Approximation and Pell's Equation
  35. Number Theory and Imaginary Numbers
  36. The Gaussian Integers and Unique Factorization
  37. Irrational Numbers and Transcendental Numbers
  38. Binomial Coefficients and Pascal's Triangle
  39. Fibonacci's Rabbits and Linear Recurrence Sequences
  40. Oh, What a Beautiful Function
  41. Cubic Curves and Elliptic Curves
  42. Elliptic Curves with Few Rational Points
  43. Points on Elliptic Curves Modulo  $p$
  44. Torsion Collections Modulo  $p$  and Bad Primes
  45. Defect Bounds and Modularity Patterns
  46. Elliptic Curves and Fermat's Last Theorem
  47. The Topsy-Turvy World of Continued Fractions [online]
  48. Continued Fractions, Square Roots, and Pell's Equation [online]
  49. Generating Functions [online]
  50. Sums of Powers [online]

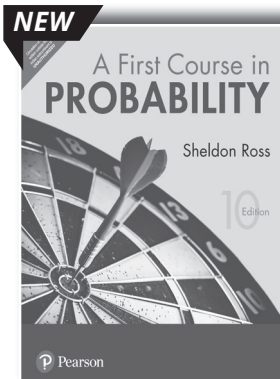
### ABOUT THE AUTHOR

Joseph H. Silverman is a Professor of Mathematics at Brown University. He received his Sc.B. at Brown and his Ph.D. at Harvard, after which he held positions at MIT and Boston University before joining the Brown faculty in 1988.

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## A First Course in Probability, 10/e



ISBN: 9789356064034

 **Sheldon M. Ross**

 **524** | © **2022**



### ABOUT THE BOOK

A First Course in Probability offers an elementary introduction to the theory of probability for students in mathematics, statistics, engineering, and the sciences. Through clear and intuitive explanations, it attempts to present not only the mathematics of probability theory, but also the many diverse possible applications of this subject through numerous examples. The 10th Edition includes many new and updated problems, exercises, and text material chosen both for inherent interest and for use in building student intuition about probability.

### FEATURES

- Analysis is unique to the text and elegantly designed. Examples include the knockout tournament and multiple players gambling ruin problem, along with results concerning the sum of uniform and the sum of geometric random variables.
- Intuitive explanations are supported with an abundance of examples to give readers a thorough introduction to both the theory and applications of probability.
- Three sets of exercises are given at the end of each chapter: Problems, Theoretical Exercises, and Self-Test Problems and Exercises.
- New - Streamlined exposition focuses on clarity and deeper understanding.
- Many new and updated problems and exercises.
- New - Examples such as Example 4n of Chapter 3, which deals with computing NCAA basketball tournament win probabilities, and Example 5b of Chapter 4, which introduces the friendship paradox.
- New - Material on the Pareto distribution, on Poisson limit results, and on the Lorenz curve.

### CONTENTS

- |   |   |
|---|---|
| 1. Combinatorial Analysis                   | 6. Jointly Distributed Random Variables |
| 2. Axioms of Probability                    | 7. Properties of Expectation            |
| 3. Conditional Probability and Independence | 8. Limit Theorems 394                   |
| 4. Random Variables                         | 9. Additional Topics in Probability     |
| 5. Continuous Random Variables              | 10. Simulation                          |

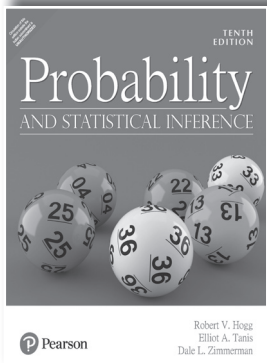
### ABOUT THE AUTHOR

**Sheldon M. Ross** is a professor in the Department of Industrial Engineering and Operations Research at the University of Southern California. He received his Ph.D. in statistics at Stanford University in 1968. He has published many technical articles and textbooks in the areas of statistics and applied probability. Among his texts are A First Course in Probability, Introduction to Probability Models, Stochastic Processes, and Introductory Statistics. Professor Ross is the founding and continuing editor of the journal Probability in the Engineering and Informational Sciences, the Advisory Editor for International Journal of Quality Technology and Quantitative Management, and an Editorial Board Member of the Journal of Bond Trading and Management. He is a Fellow of the Institute of Mathematical Statistics and a recipient of the Humboldt US Senior Scientist Award.

# Probability and Statistical Inference, 10/e

 Robert V. Hogg | Elliot Tanis | Dale Zim

 564 | © 2021



ISBN: 9789353947781

## ABOUT THE BOOK

Advances in computing technology – particularly in science and business – have increased the need for more statistical scientists to examine the huge amount of data being collected. Written by veteran statisticians, Probability and Statistical Inference, 10th Edition emphasizes the existence of variation in almost every process, and how the study of probability and statistics helps us understand this variation. This applied introduction to probability and statistics reinforces basic mathematical concepts with numerous real-world examples and applications to illustrate the relevance of key concepts. It is designed for a two-semester course,

but it can be adapted for a one-semester course. A good calculus background is needed, but no previous study of probability or statistics is required.

## FEATURES

- Approximately 25 new examples and more than 75 new exercises have been added.
- A new section (Section 2.5) on the hypergeometric distribution is provided, adding to material previously scattered throughout the first and second chapters.
- Discussion of new topics includes the index of skewness and the laws of total probability for expectations and the variance.
- New material has been added on the topics of percentile matching and the invariance of maximum likelihood estimation.
- A new section on hypothesis testing for variances also includes confidence intervals for a variance and for the ratio of two variances.

## CONTENTS

### 1. Probability

- 1.1 Properties of Probability
- 1.2 Methods of Enumeration
- 1.3 Conditional Probability
- 1.4 Independent Events
- 1.5 Bayes' Theorem

### 2. Discrete Distributions

- 2.1 Random Variables of the Discrete Type
- 2.2 Mathematical Expectation
- 2.3 Special Mathematical Expectations
- 2.4 The Binomial Distribution
- 2.5 The Hypergeometric Distribution
- 2.6 The Negative Binomial Distribution
- 2.7 The Poisson Distribution

### 3. Continuous Distributions

- 3.1 Random Variables of the Continuous Type
- 3.2 The Exponential, Gamma, and Chi-Square Distributions
- 3.3 The Normal Distribution
- 3.4 Additional Models



#### 4. Bivariate Distributions

- 4.1 Bivariate Distributions of the Discrete Type
- 4.2 The Correlation Coefficient
- 4.3 Conditional Distributions
- 4.4 Bivariate Distributions of the Continuous Type
- 4.5 The Bivariate Normal Distribution

#### 5. Distributions of Functions of Random Variables

- 5.1 Functions of One Random Variable
- 5.2 Transformations of Two Random Variables
- 5.3 Several Independent Random Variables
- 5.4 The Moment-Generating Function Technique
- 5.5 Random Functions Associated with Normal Distributions
- 5.6 The Central Limit Theorem
- 5.7 Approximations for Discrete Distributions
- 5.8 Chebyshev's Inequality and Convergence in Probability
- 5.9 Limiting Moment-Generating Functions

#### 6. Point Estimation

- 6.1 Descriptive Statistics
- 6.2 Exploratory Data Analysis
- 6.3 Order Statistics
- 6.4 Maximum Likelihood and Method of Moments Estimation
- 6.5 A Simple Regression Problem
- 6.6 Asymptotic Distributions of Maximum Likelihood Estimators
- 6.7 Sufficient Statistics
- 6.8 Bayesian Estimation

#### 7. Interval Estimation

- 7.1 Confidence Intervals for Means
- 7.2 Confidence Intervals for the Difference of Two Means
- 7.3 Confidence Intervals for Proportions
- 7.4 Sample Size
- 7.5 Distribution-Free Confidence Intervals for Percentiles
- 7.6 More Regression
- 7.7 Resampling Methods

#### 8. Tests of Statistical Hypotheses

- 8.1 Tests About One Mean
- 8.2 Tests of the Equality of Two Means
- 8.3 Tests for Variances
- 8.4 Tests About Proportions
- 8.5 Some Distribution-Free Tests
- 8.6 Power of a Statistical Test
- 8.7 Best Critical Regions
- 8.8 Likelihood Ratio Tests

#### 9. More Tests

- 9.1 Chi-Square Goodness-of-Fit Tests
- 9.2 Contingency Tables
- 9.3 One-Factor Analysis of Variance
- 9.4 Two-Way Analysis of Variance
- 9.5 General Factorial and  $2^k$  Factorial Designs
- 9.6 Tests Concerning Regression and Correlation
- 9.7 Statistical Quality Control

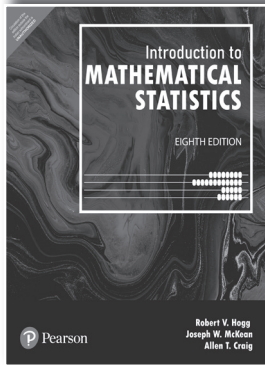


## ABOUT THE AUTHOR

**Robert V. Hogg (deceased)**, Professor Emeritus of Statistics at the University of Iowa since 2001, received his B.A. in mathematics at the University of Illinois and his M.S. and Ph.D. degrees in mathematics, specializing in actuarial sciences and statistics, from the University of Iowa. Known for his gift of humor and his passion for teaching, Hogg had far-reaching influence in the field of statistics. Throughout his career, Hogg played a major role in defining statistics as a unique academic field, and he almost literally “wrote the book” on the subject. He wrote more than 70 research articles and co-authored four books, including Introduction of Mathematical Statistics, 6th Edition with J. W. McKean and A.T. Craig; Applied Statistics for Engineers and Physical Scientists, 3rd Edition with J. Ledolter; and A Brief Course in Mathematical Statistics, 1st Edition with E.A. Tanis. His texts have become classroom standards used by hundreds of thousands of students. Elliot Tanis, Professor Emeritus of Mathematics at Hope College, received his M.S. and Ph.D. degrees from the University of Iowa. Tanis is the co-author of A Brief Course in Mathematical Statistics with R. Hogg and Probability and Statistics: Explorations with MAPLE, 2nd Edition with Z. Karian. He has authored over 30 publications on statistics and is a past chairman and governor of the Michigan MAA, which presented him with both its Distinguished Teaching and Distinguished Service Awards. He taught at Hope for 35 years and in 1989 received the HOPE Award (Hope’s Outstanding Professor Educator) for his excellence in teaching. In addition to his academic interests, Dr. Tanis is also an avid tennis player and devoted Hope sports fan. Dale Zimmerman is the Robert V. Hogg Professor in the Department of Statistics and Actuarial Science at the University of Iowa.

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# Introduction to Mathematical Statistics, 8/e



ISBN: 9789353946760

 Robert V. Hogg | Allen T. Craig | Joseph W. McKean

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## ABOUT THE BOOK

Introduction to Mathematical Statistics by Hogg, McKean, and Craig enhances student comprehension and retention with numerous, illustrative examples and exercises. Classical statistical inference procedures in estimation and testing are explored extensively, and the text's flexible organization makes it ideal for a range of mathematical statistics courses. Substantial changes to the 8th Edition – many based on user feedback – help students appreciate the connection between statistical theory and statistical practice, while other changes enhance the development

## FEATURES

- Many additional real data sets to illustrate statistical methods or compare methods.
- Expanded use of the statistical software R, a powerful statistical language which is free and can run on all three main platforms.
- Expanded discussion of iterated integrals, with added figures to clarify discussion.
- Several important topics have been added, including a subsection on the bivariate normal distribution, Tukey's multiple comparison procedure and confidence intervals for the correlation coefficients.
- Discussion on standard errors for estimates obtained by bootstrapping the sample is now included.

## CONTENTS

1. Probability and Distributions
  2. Multivariate Distributions
  3. Some Special Distributions
  4. Some Elementary Statistical Inferences
  5. Consistency and Limiting Distributions
  6. Maximum Likelihood Methods
  7. Sufficiency
  8. Optimal Tests of Hypotheses
  9. Inferences About Normal Linear Models
  10. Nonparametric and Robust Statistics
  11. Bayesian Statistics
- Appendices:
- A. Mathematical Comments
  - B. R Primer
  - C. Lists of Common Distributions
  - D. Table of Distributions
  - E. References
  - F. Answers to Selected Exercises

## ABOUT THE AUTHOR(S)

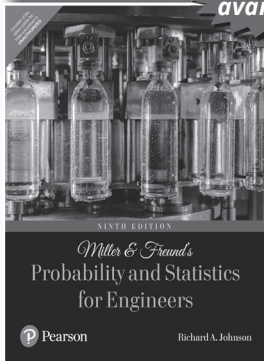
Robert V. Hogg, University of Iowa

Joseph McKean, Allen T. Craig, Late, Professor of Statistics, University of Iowa

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## Miller and Freund's Probability and Statistics for Engineers, 9/e

E-Book  
available



ISBN: 9789353945237

 **Richard A. Johnson**

 **560** |  **2020**

### ABOUT THE BOOK

Miller & Freund's Probability and Statistics for Engineers is rich in exercises and examples, and explores both elementary probability and basic statistics, with an emphasis on engineering and science applications. Much of the data has been collected from the author's own consulting experience and from discussions with scientists and engineers about the use of statistics in their fields. In later chapters, the text emphasizes designed experiments, especially two-level factorial design. The Ninth Edition includes several new datasets and examples showing application of statistics in scientific investigations, familiarizing students with the latest methods, and readying them to become real-world engineers and scientists.

### FEATURES

- Many new examples on important current engineering and scientific data further strengthen the text's orientation towards an applications-based introduction to statistics
- Added graphs illustrating P-values appear in several examples along with an interpretation
- More details about using R commands make it easy for students to check calculations on their own laptop or tablet, while reading an example.
- Key formulas are stressed and calculation formulas are downplayed. Computation formulas are set in the context of an application which only requires all, or mostly all, integer arithmetic, and now appear only at the end of sections. Students can then check their results with their choice of software.
- All examples are now numbered within each chapter.
- New data-based exercises feature real applications to help stimulate interest and strengthen a student's appreciation of the role of statistics in engineering applications.

### CONTENTS

1. Introduction
  2. Organization and Description of Data
  3. Probability
  4. Probability Distributions
  5. Probability Densities
  6. Sampling Distributions
  7. Inferences Concerning a Mean
  8. Comparing Two Treatments
  9. Inferences Concerning Variances
  10. Inferences Concerning Proportions
  11. Regression Analysis
  12. Analysis of Variance
  13. Factorial Experimentation
  14. Nonparametric Tests
  15. The Statistical Content of Quality-Improvement Programs
  16. Application to Reliability and Life Testing
- Appendix A Bibliography  
Appendix B Statistical Tables  
Appendix C Using the R Software Program  
Appendix D Answers to Odd-Numbered Exercises

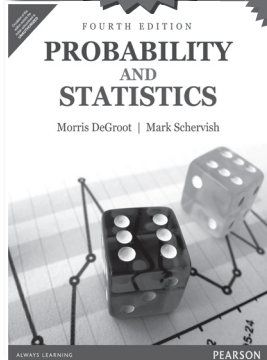
### ABOUT THE AUTHOR

**Richard A. Johnson** University of Wisconsin–Madison

## Probability and Statistics, 4/e

E-Book  
available

POD



ISBN: 9789332573871



Morris H. DeGroot | Mark J. Schervish



2016 | © 2016

### ABOUT THE BOOK

The revision of this well-respected text presents a balanced approach of the classical and Bayesian methods and now includes a chapter on simulation (including Markov chain Monte Carlo and the Bootstrap), coverage of residual analysis in linear models, and many examples using real data.

*Probability & Statistics*, Fourth Edition, was written for a one- or two-semester probability and statistics course. This course is offered primarily at four-year institutions and taken mostly by sophomore and junior level students majoring in mathematics or statistics. Calculus is a prerequisite, and a familiarity with the concepts and elementary properties of vectors and matrices is a plus.

### FEATURES

- Brief introductions in each technical section give readers a hint about what they are going to encounter, while summaries list the most important ideas.
- In addition to examples using current data, some elementary concepts of probability are illustrated by famous examples such as the birthday problem, the tennis tournament problem, the matching problem, and the collector's problem.
- Special features include sections on Markov chains, the gambler's ruin problem, and utility and preferences among gamblers. These topics are presented in an elementary fashion and can be omitted without loss of continuity.
- Optional sections of the book are indicated by an asterisk in the Table of Contents.
- Chapters 1—5 are devoted to probability and can serve as the text for a one-semester course on probability. Independence is now introduced after conditional probability.
- Chapters 6—10 are devoted to statistical inference. Both classical and Bayesian statistical methods are developed in an integrated presentation which will be useful to students when applying the concepts to the real world.

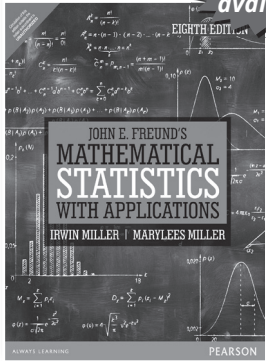
### CONTENTS

1. Introduction to Probability
2. Conditional Probability
3. Random Variables and Distributions
4. Expectation
5. Special Distributions
6. Large Random Samples
7. Estimation
8. Sampling Distributions of Estimators
9. Testing Hypotheses
10. Categorical Data and Nonparametric Methods
11. Linear Statistical Models



## John E. Freund's Mathematical Statistics with Applications, 8/e

E-Book  
available



ISBN: 9789332519053



Irwin Miller | Marylees Miller



476 | © 2014



### ABOUT THE BOOK

John E. Freund's *Mathematical Statistics with Applications*, Eighth Edition, provides a calculus-based introduction to the theory and application of statistics, based on comprehensive coverage that reflects the latest in statistical thinking, the teaching of statistics, and current practices.

This text is appropriate for a two-semester or three-quarter calculus-based course in Introduction to Mathematical Statistics. It can also be used for a single-semester course emphasizing probability, probability distributions and densities, sampling, and classical statistical inference

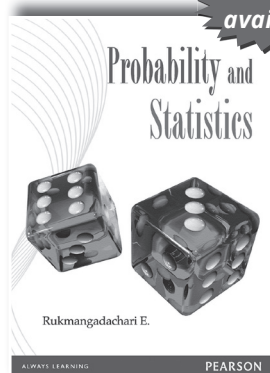
### FEATURES

- “The Theory in Practice” sections at the end of every chapter give students the chance to apply the methods they've learned.
- More than 1,200 exercises offer a wide variety to choose from in creating assignments, tests, and class work. Many of these exercises offer the opportunity to use technology so that students can understand the role of computers in factoring and analyzing statistical data.
- Comprehensive coverage of statistical theories students have appreciated for generations.
- Comprehensive appendices summarize the properties of the special probability distributions and density functions, making this text an invaluable reference.

### CONTENTS

1. Introduction
2. Probability
3. Probability Distributions and Probability Densities
4. Mathematical Expectation
5. Special Probability Distributions
6. Special Probability Densities
7. Functions of Random Variables
8. Sampling Distributions
9. Decision Theory
10. Point Estimation
11. Interval Estimation
12. Hypothesis Testing
13. Tests of Hypotheses Involving Means, Variances, and Proportions
14. Regression and Correlation
15. Appendix: Sums and Products
16. Appendix: Special Probability Distributions
17. Appendix: Special Probability Densities
18. Statistical tables





**E-Book available**

**ISBN: 9788131761366**

## Probability and Statistics

 **E. Rukmangadachari**

 **258 | © 2012**

### ABOUT THE BOOK

This book is designed for engineering students studying the core paper on probability and statistics during their second or third years. It includes detailed explanation of theory with numerous examples and exercises, as well as relevant references to engineering applications. Each chapter also has numerous objective type questions, and answers and hints are provided for all the exercise problems and objective type questions.

### FEATURES

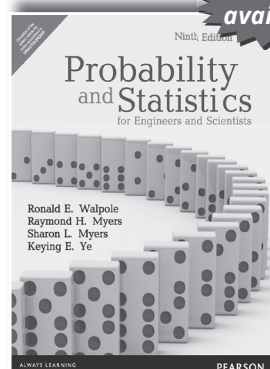
- Detailed examination of special probability distributions
- A separate chapter on estimation theory
- Detailed examination of regression and correlation analysis
- A separate chapter on queuing theory

### CONTENTS

1. Probability
2. Probability Distribution
3. Special Distribution
4. Sampling Distributions
5. Estimation Theory
6. Inferences Concerning Means and Proportions
7. Tests of Significance
8. Curve Fitting: Regression and Correlation Analysis
9. Queueing Theory

### ABOUT THE AUTHOR(S)

**E Rukmangadachari** is former head of Computer Science and Engineering as well as Humanities and Sciences at Malla Reddy Engineering College, Secunderabad. He is an MA from Osmania University, and an M.PHIL. and Ph.D. degree holder from Sri Venkateswara University, Thirupathi.



**E-Book available**

**ISBN: 9789332519084**

## Probability and Statistics for Engineers and Scientists, 9/e

 **Ronald E. Walpole | Raymond H. Myers | Sharon L. Myers | Keying Ye**

 **950 | © 2014**



### ABOUT THE BOOK

This classic text provides a rigorous introduction to basic probability theory and statistical inference, with a unique balance between theory and methodology. Interesting, relevant applications use real data from actual studies, showing how the concepts and methods can be used to solve problems in the field. This revision focuses on improved clarity and deeper understanding.



## FEATURES

- The balance between theory and applications offers mathematical support to enhance coverage when necessary, giving engineers and scientists the proper mathematical context for statistical tools and methods.
- Mathematical level: this text assumes one semester of differential and integral calculus as a prerequisite.
  - Calculus is confined to elementary probability theory and probability distributions (Chapters 2-7).
  - Matrix algebra is used modestly in coverage of linear regression material (Chapters 11-12).
  - Linear algebra and the use of matrices are applied in Chapters 11-15, where treatment of linear regression and analysis of variance is covered.
- Compelling exercise sets challenge students to use the concepts to solve problems that occur in many real-life scientific and engineering situations. Many exercises contain real data from studies in the fields of biomedical, bioengineering, business, computing, etc.
- Real-life applications of the Poisson, binomial, and hypergeometric distributions generate student interest using topics such as flaws in manufactured copper wire, highway potholes, hospital patient traffic, airport luggage screening, and homeland security.

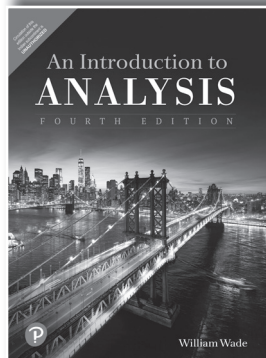
## CONTENTS

1. Introduction to Statistics and Data Analysis
2. Probability
3. Random Variables and Probability Distributions
4. Mathematical Expectation
5. Some Discrete Probability Distributions
6. Some Continuous Probability Distributions
7. Functions of Random Variables (Optional)
8. Sampling Distributions and More Graphical Tools
9. One- and Two-Sample Estimation Problems
10. One- and Two-Sample Tests of Hypotheses
11. Simple Linear Regression and Correlation
12. Multiple Linear Regression and Certain Nonlinear Regression Models
13. One-Factor Experiments: General
14. Factorial Experiments (Two or More Factors)
15. 2k Factorial Experiments and Fractions
16. Nonparametric Statistics
17. Statistical Quality Control
  - A. Statistical Tables and Proofs
  - B. Answers to Odd-Numbered Non-Review Exercises

## ABOUT THE AUTHOR(S)

- Ronald E. Walpole
  - Raymond H. Myers, Virginia Polytechnic Institute
  - Sharon L. Myers
  - Keying E. Ye, Virginia Polytechnic Institute & State University
-

## An Introduction to Analysis, 4/e



ISBN: 9789353432768

 William Wade

 696 | © 2019
**ABOUT THE BOOK**

This text prepares students for future courses that use analytic ideas, such as real and complex analysis, partial and ordinary differential equations, numerical analysis, fluid mechanics, and differential geometry. The book is designed to challenge advanced students while encouraging and helping weaker students. Offering readability, practicality and flexibility, Wade presents fundamental theorems and ideas from a practical viewpoint, showing students the motivation behind the mathematics and enabling them to construct their own proofs.

**FEATURES**

- The **practical focus** explains assumptions so that students learn the motivation behind the mathematics and are able to construct their own proofs.
- **Theoretical exercises** of medium difficulty have been added throughout the book.
- **New True/False questions** in the first six chapters confront common misconceptions that students sometimes acquire at this level.
- **Early introduction of the fundamental goals of analysis** refers and examines how a limit operation interacts with algebraic operation.
- **Separate coverage of topology and analysis** presents purely computational material first, followed by topological material in alternate chapters.
- **More than 200 worked examples and 600 exercises** encourage students to test comprehension of concepts, while using techniques in other contexts.

**CONTENTS**

- |                                      |   |
|--------------------------------------|---|
| 1. The Real Number System            | 8. Euclidean Spaces                         |
| 2. Sequences in $\mathbb{R}$         | 9. Convergence in $\mathbb{R}^n$            |
| 3. Continuity on $\mathbb{R}$        | 10. Metric Spaces                           |
| 4. Differentiability on $\mathbb{R}$ | 11. Differentiability on $\mathbb{R}^n$     |
| 5. Integrability on $\mathbb{R}$     | 12. Integration on $\mathbb{R}^n$           |
| 6. Infinite Series of Real Numbers   | 13. Fundamental Theorems of Vector Calculus |
| 7. Infinite Series of Functions      | 14. Fourier Series                          |

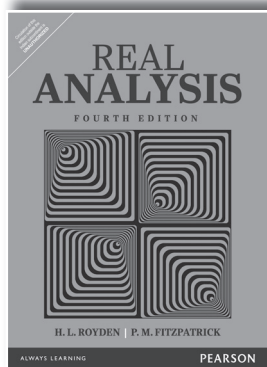
**ABOUT THE AUTHOR**

**William Wade** received his PhD in harmonic analysis from the University of California—Riverside. He has been a professor of the Department of Mathematics at the University of Tennessee for more than forty years. During that time, he has received multiple awards including two Fulbright Scholarships, the Chancellor's Award for Research and Creative Achievements, the Dean's Award for Extraordinary Service, and the National Alumni Association Outstanding Teaching Award.

## Real Analysis, 4/e

 Halsey Royden | Patrick Fitzpatrick

 544 | © 2015



ISBN: 9789332551589

### ABOUT THE BOOK

*Real Analysis*, Fourth Edition, covers the basic material that every graduate student should know in the classical theory of functions of a real variable, measure and integration theory, and some of the more important and elementary topics in general topology and normed linear space theory. This text assumes a general background in undergraduate mathematics and familiarity with the material covered in an undergraduate course on the fundamental concepts of analysis. Patrick Fitzpatrick of the University of Maryland—College Park spearheaded this revision of Halsey Royden's classic text

### FEATURES

- Independent, modular chapters give instructors the freedom to arrange the material into a course according that suits their needs. A chart in the text gives the essential dependencies.
- Content is divided into three parts:
  - Part 1: Classical theory of functions, including the classical Banach spaces
  - Part 2: General topology and the theory of general Banach spaces
  - Part 3: Abstract treatment of measure and integration
- Throughout the text, an understanding of the linkages between the three parts is fostered. The expanded collection of problems range from those that confirm understanding of basic results and ideas to those that are quite challenging; many problems foreshadow future developments.

### CONTENTS

#### Part I: Lebesgue Integration For Functions Of A Single Real Variable

1. The Real Numbers: Sets, Sequences and Functions
2. Lebesgue Measure
3. Lebesgue Measurable Functions
4. Lebesgue Integration
5. Lebesgue Integration: Further Topics
6. Differentiation and Integration
7. The Spaces: Completeness and Approximation
8. The Spaces: Duality and Weak Convergence

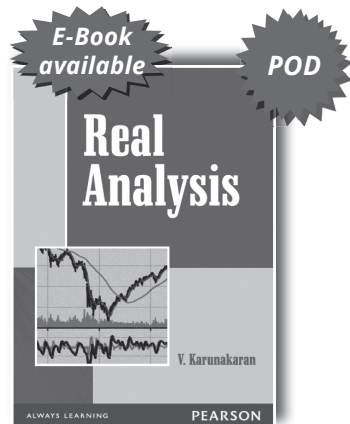
#### Part II: Abstract Spaces: Metric, Topological, And Hilbert

9. Metric Spaces: General Properties
10. Metric Spaces: Three Fundamental Theorems
11. Topological Spaces: General Properties

12. Topological Spaces: Three Fundamental Theorems
13. Continuous Linear Operators Between Banach Spaces
14. Duality for Normed Linear Spaces
15. Compactness Regained: The Weak Topology
16. Continuous Linear Operators on Hilbert Spaces

#### Part III: Measure And Integration: General Theory

17. General Measure Spaces: Their Properties and Construction
18. Integration Over General Measure Spaces
19. General Spaces: Completeness, Duality and Weak Convergence
20. The Construction of Particular Measures
21. Measure and Topology
22. Invariant Measures



ISBN: 9788131757987

## Real Analysis

 V. Karunakaran

 600 | © 2011



### ABOUT THE BOOK

This text book is designed for an undergraduate course on mathematics. It covers the basic material that every graduate student should know in the classical theory of functions of real variables, measures, limits and continuity. This text book offers readability, practicality and flexibility. It presents fundamental theorems and ideas from a practical viewpoint, showing students the motivation behind mathematics and enabling them to construct their own proofs.

### FEATURES

- Comprehensive coverage of sequence and series
- Detailed coverage of topics like measure theory, set theory, limits and continuity
- The theory is well explained, with an equal number of theorems and examples for all topics, including  $L_p$  spaces, real number system, measure theory and sequence and series
- A very flexible presentation with a uniform writing style and notation, covering the material in small sections, which allows instructors and students to adapt this book to their syllabus

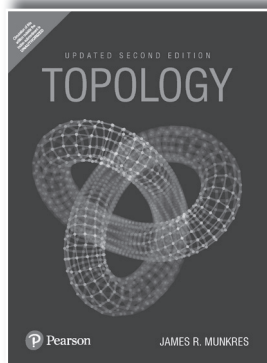
### CONTENTS

1. Basic Properties of the Real number system
2. Some Finer Aspects of Set Theory
3. Sequences and Series
4. Topological aspects of the real line
5. Limits and Continuity
6. Differentiation
7. Functions of Bounded variation
8. Riemann Integration
9. Sequences and series of functions
10. Power series and special functions
11. Fourier Series
12. Real-valued Functions of two real variables
13. Lebesgue Measure and Integration
14.  $L_p$  - Spaces

### ABOUT THE AUTHOR

V. Karunakaran has 35 years of research experience specializing in real, complex and functional analysis. He was a life member of the Indian Mathematical Society, Association of Mathematics Teachers of India, a fellow of the Forum D'Analystes, Chennai, and a regular reviewer for Zentralblatt für Mathematik.

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ISBN: 9789353432775

## Topology, Updated 2/e

 **James R. Munkres**

 **556** | © **2021**

### ABOUT THE BOOK

This text is designed to provide instructors with a convenient single text resource for bridging between general and algebraic topology courses. Two separate, distinct sections (one on general, point set topology, the other on algebraic topology) are each suitable for a one-semester course and are based around the same set of basic, core topics. Optional, independent topics and applications can be studied and developed in depth depending on course needs and preferences.

### FEATURES

- New! Greatly expanded, full-semester coverage of algebraic topology—Extensive treatment of the fundamental group and covering spaces. What follows is a wealth of applications—to the topology of the plane (including the Jordan curve theorem), to the classification of compact surfaces, and to the classification of covering spaces. A final chapter provides an application to group theory itself.
- Follows the present-day trend in the teaching of topology which explores the subject much more extensively with one semester devoted to general topology and a second to algebraic topology.
- Advanced topics—Such as metrization and imbedding theorems, function spaces, and dimension theory are covered after connectedness and compactness.
- Order of topics proceeds naturally from the familiar to the unfamiliar—Begins with the familiar set theory, moves on to a thorough and careful treatment of topological spaces, then explores connectedness and compactness (with their many ties to calculus and analysis), and then branches out to the new and different topics mentioned above.
- Many examples and figures—Exploits six basic counterexamples repeatedly.
- Exercises—Varied in difficulty from the routine to the challenging.

### CONTENTS

#### I. General Topology.

1. Set Theory and Logic.
2. Topological Spaces and Continuous Functions.
3. Connectedness and Compactness.
4. Countability and Separation Axioms.
5. The Tychonoff Theorem.
6. Metrization Theorems and Paracompactness.
7. Complete Metric Spaces and Function Spaces.
8. Baire Spaces and Dimension Theory.

#### II. Algebraic Topology.

9. The Fundamental Group.
10. Separation Theorems in the Plane.
11. The Seifert-van Kampen Theorem.
12. Classification of Surfaces.
13. Classification of Covering Spaces.
14. Applications to Group Theory.

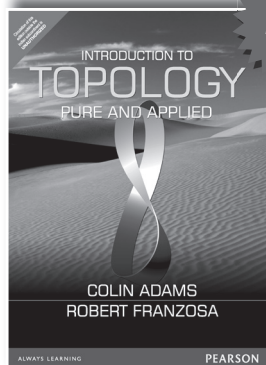
### ABOUT THE AUTHOR

James Raymond Munkres is a Professor Emeritus of mathematics at MIT and the author of several texts in the area of topology, including *Topology*, *Analysis on Manifolds*, *Elements of Algebraic Topology*, and *Elementary Differential Topology*.

## Introduction to Topology

 Colin Adams | Robert Franzosa

 512 | © 2009



ISBN: 9788131726921

### ABOUT THE BOOK

This book introduces topology as an important and fascinating mathematics discipline. Students learn first the basics of point-set topology, which is enhanced by the real-world application of these concepts to science, economics, and engineering as well as other areas of mathematics. The second half of the book focuses on topics like knots, robotics, and graphs. The text is written in an accessible way for a range of undergraduates to understand the usefulness and importance of the application of topology to other fields.

### FEATURES

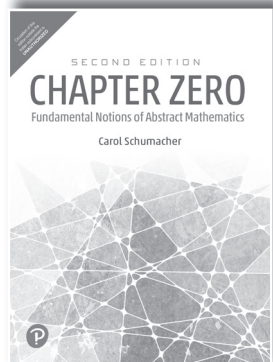
- Theoretical and applied approach- the authors focus on the basic concepts of
- Intuitive and accessibly written text
- Rigorous presentation of the mathematics with intuitive descriptions and discussions to increase student understand.
- Examples of real world application keep students engrossed in the material
- Numerous figures allow students to visualize and understand the material presented

### CONTENTS

1. Introduction
2. Topological Spaces
3. Interior, Closure, and Boundary
4. Creating New Topological Spaces
5. Continuous Functions and Homeomorphisms
6. Metric Spaces
7. Connectedness
8. Compactness
9. Dynamical Systems and Chaos
10. Homotopy and Degree Theory
11. Fixed Point Theorems and Applications
12. Embeddings
13. Knots
14. Graphs and Topology
15. Manifolds and Cosmology



## Chapter Zero, 2/e



ISBN: 9789353432744

 Carol Schumacher

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### ABOUT THE BOOK

*Chapter Zero: Fundamental Notions of Abstract Mathematics* is designed for the sophomore/junior level Introduction to Advanced Mathematics course. Written in a modified R.L. Moore fashion, it offers a unique approach in which students construct their own understandings. However, while students are called upon to write their own proofs, they are also encouraged to work in groups. The text also offers “proof sketches” and helpful technique tips to help students as they develop their proof writing skills.

### FEATURES

- NEW! Coverage of Isomorphisms and Graph Theory.
- Exercise sections have been improved by smoothing out the grade of difficulty.
- Proof Sketches are woven throughout the early chapters of the text, assisting students with proof techniques.
- Logic is used as a tool for analyzing the content of mathematical assertions and for constructing valid mathematical proofs.
- Rigorous axiomatic treatment of set theory is introduced in Appendices A and B.

### CONTENTS

- |              |                             |
|--------------|-----------------------------|
| 1. Logic     | 5. Functions                |
| 2. Sets      | 6. Elementary Number Theory |
| 3. Induction | 7. Cardinality              |
| 4. Relations | 8. The Real Numbers         |

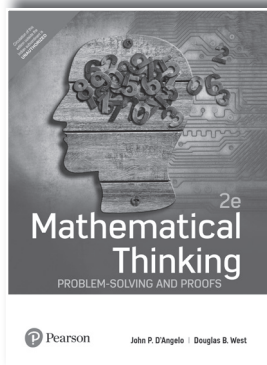
### ABOUT THE AUTHOR

Professor of Mathematics, Kenyon College.

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## Mathematical Thinking: Problem-Solving and Proofs, 2/e



ISBN: 9789353433093

 John D'Angelo | Douglas B. West

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### ABOUT THE BOOK

This text is designed to prepare students *thoroughly* in the logical thinking skills necessary to understand and communicate fundamental ideas and proofs in mathematics—skills vital for success throughout the upper class mathematics curriculum. It begins by discussing mathematical language and proof techniques including induction, applies them to easily-understood questions in elementary number theory and counting, and then develops additional techniques of proof via important topics in discrete and continuous mathematics. The stimulating exercises are *acclaimed for their exceptional quality*.

### FEATURES

- **Emphasis on understanding rather than manipulation**—Stresses full comprehension rather than rote symbolic manipulation for mastery of proof techniques and mathematical ideas.
- **Engaging examples**—Interesting applications introduce and motivate the underlying mathematics.
- **Hints for selected exercises**—Provides immediate hints for some exercises and hints for others in an appendix.
- **Superior exercise sets**—Offers over 850 exercises ranging from relatively straightforward applications of ideas in the text to subtle problems requiring some ingenuity.
- **Gradation of exercises**—Distinguishes easier exercises by (-), harder by (+), and particularly valuable or instructive exercises by (!).

### CONTENTS

#### PART I. ELEMENTARY CONCEPTS.

1. Numbers, Sets and Functions.
2. Language and Proofs.
3. Induction.
4. Bijections and Cardinality.

#### PART II. PROPERTIES OF NUMBERS.

5. Combinatorial Reasoning.
6. Divisibility.
7. Modular Arithmetic.
8. The Rational Numbers.

#### PART III. DISCRETE MATHEMATICS.

9. Probability.
10. Two Principles of Counting.
11. Graph Theory.
12. Recurrence Relations.

#### PART IV. CONTINUOUS MATHEMATICS.

13. The Real Numbers.
14. Sequences and Series.
15. Continuous Functions.
16. Differentiation.
17. Integration.
18. The Complex Numbers.

### ABOUT THE AUTHOR

John D'Angelo Vice President of Facilities Management at Northwestern University. Douglas West is a professor of graph theory at University of Illinois at Urbana-Champaign.

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# AUTHOR INDEX

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