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A6B - LEONIDAS CHAIM

This second edition of Daniel W. Stroock's text is suitable for first-year graduate students with a good grasp of introductory, undergraduate probability theory and a sound grounding in analysis. It is intended to provide readers with an introduction to probability theory and the analytic ideas and tools on which the modern theory relies. It includes more than 750 exercises. Much of the content has undergone significant revision. In particular, the treatment of Levy processes has been rewritten, and a detailed account of Gaussian measures on a Banach space is given.

The standard rules of probability can be interpreted as uniquely valid principles in logic. In this book, E. T. Jaynes dispels the imaginary distinction between 'probability theory' and 'statistical inference', leaving a logical unity and simplicity, which provides greater technical power and flexibility in applications. This book goes beyond the conventional mathematics of probability theory, viewing the subject in a wider context. New results are discussed, along with applications of probability theory to a wide variety of problems in physics, mathematics, economics, chemistry and biology. It contains many exercises and problems, and is suitable for use as a textbook on graduate level courses involving data analysis. The material is aimed at readers who are already familiar with applied mathematics at an advanced undergraduate level or higher. The book will be of interest to scientists working in any area where inference from incomplete information is necessary.

The purpose of this book is to provide the reader with a solid background and understanding of the basic results and methods in probability the ory before entering into more advanced courses (in probability and/or statistics). The presentation is fairly thorough and detailed with many solved examples. Several examples are solved with different methods in order to illustrate their different levels of sophistication, their pros, and their cons. The motivation for this style of exposition is that experi ence has proved that the hard part in courses of this kind usually in the application of the results and methods; to know how, when, and where to apply what; and then, technically, to solve a given problem once one knows how to proceed. Exercises are spread out along the way, and every chapter ends with a large selection of problems. Chapters I through VI focus on some central areas of what might be called pure probability theory: multivariate random variables, condi tioning, transforms, order variables, the multivariate normal distribution, and convergence. A final chapter is devoted to the Poisson process be cause of its fundamental role in the theory of stochastic processes, but also because it provides an excellent application of the results and meth ods acquired earlier in the book. As an extra bonus, several facts about this process, which are frequently more or less taken for granted, are thereby properly verified.

This book provides a clear exposition of the theory of probability along with applications in statistics.

This book contains about 500 exercises consisting mostly of special cases and examples, second thoughts and alternative arguments, natural extensions, and some novel departures. With a few obvious exceptions they are neither profound nor trivial, and hints and comments are appended to many of them. If they tend to be somewhat inbred, at least they are relevant to the text and should help in its digestion. As a bold venture I have marked a few of them with a * to indicate a "must", although no rigid standard of selection has been used. Some of these are needed in the book, but in any case the reader's study of the text will be more complete after he has tried at least those problems.

"The third edition earmarks the great success of this text among the students as well as the teachers. To enhance its utility one additional appendix on "The Theory of Errors" has been incorporated along with necessary modifications and corrections in the text. The treatment, as before, is rigorous yet impressively elegant and simple. The special feature of this text is its effort to resolve many outstanding confusions of probability and statistics. This will undoubtedly continue to be a valuable companion for all those pursuing a career in Statistics."--BOOK JACKET.

Probability theory and its applications represent a discipline of fun damental importance to nearly all people working in the high-tech nology world that surrounds us. There is increasing awareness that we should ask not "Is it so?" but rather "What is the probability that it is so?" As a result, most colleges and universities require a course in mathematical probability to be given as part of the undergraduate training of all scientists, engineers, and mathematicians. This book is a text for a first course in the mathematical theory of probability for undergraduate students who have the prerequisite of at least two, and better three, semesters of calculus. In particular, the student must have a good working knowledge of power series expan sions and integration. Moreover, it would be helpful if the student has had some previous exposure to elementary probability theory, either in an elementary statistics course or a finite mathematics course in high school or college. If these prerequisites are met, then a good part of the material in this book can be covered in a semester (IS-week) course that meets three hours a week.

Aimed primarily at graduate students and researchers, this text is a comprehensive course in modern probability theory and its measure-theoretical foundations. It covers a wide variety of topics, many of which are not usually found in introductory textbooks. The theory is developed rigorously and in a self-contained way, with the chapters on measure theory interlaced with the probabilistic chapters in order to display the power of the abstract concepts in the world of probability theory. In addition, plenty of figures, computer simulations, biographic details of key mathematicians, and a wealth of examples support and enliven the presentation.

This work thoroughly covers the concepts and main results of probability theory, from its fundamental principles to advanced applications. This edition provides examples early in the text of practical problems such as the safety of a piece of engineering equipment or the inevitability of wrong conclusions in seemingly accurate medical tests for AIDS and cancer.;College or university bookstores may order five or more copies at a special student price which is available upon request from Marcel Dekker, Inc.

For upper-level to graduate courses in Probability or Probability and Statistics, for majors in mathematics, statistics, engineering, and the sciences. Explores both the mathematics and the many potential applications of probability theory A First Course in Probability is an elementary introduction to the theory of probability for students in mathematics, statistics, engineering, and the sciences. Through clear and intuitive explanations, it presents 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 interest level and for use in building student intuition about probability. 0134753119 / 9780134753119 A First Course in Probability, 10/e

This text develops the necessary background in probability theory underlying diverse treatments of stochastic processes and their wide-ranging applications. In this second edition, the text has been reorganized for didactic purposes, new exercises have been added and basic theory has been expanded. General Markov dependent sequences and their convergence to equilibrium is the subject of an entirely new chapter. The introduction of conditional expectation and conditional probability very early in the text maintains the pedagogic innovation of the first edition; conditional expectation is illustrated in detail in the context of an expanded treatment of martingales, the Markov property, and the strong Markov property. Weak convergence of probabilities on metric spaces and Brownian motion are two topics to highlight. A selection of large deviation and/or concentration inequalities ranging from those of Chebyshev, Cramer–Chernoff, Bahadur–Rao, to Hoeffding have been added, with illustrative comparisons of their use in practice. This also includes a treatment of the Berry–Esseen error estimate in the central limit theorem. The authors assume mathematical maturity at a graduate level; otherwise the book is suitable for students with varying levels of background in analysis and measure theory. For the reader who needs refreshers, theorems from analysis and measure theory used in the main text are provided in comprehensive appendices, along with their proofs, for ease of reference. Rabi Bhattacharya is Professor of Mathematics at the University of Arizona. Edward Waymire is Professor of Mathematics at Oregon State University. Both authors have co-authored numerous books, including a series of four upcoming graduate textbooks in stochastic processes with applications.

This book provides a systematic, self-sufficient and yet short presentation of the mainstream topics on introductory Probability Theory with some selected topics from Mathematical Statistics. It is suitable for a 10- to 14-week course for second- or third-year undergraduate students in Science, Mathematics, Statistics, Finance, or Economics, who have completed some introductory course in Calculus. There is a sufficient number of problems and solutions to cover weekly tutorials.

Probability theory is one branch of mathematics that is simultaneously deep and immediately applicable in diverse areas of human endeavor. It is as fundamental as calculus. Calculus explains the external world, and probability theory helps predict a lot of it. In addition, problems in probability theory have an innate appeal, and the answers are often structured and strikingly beautiful. A solid background in probability theory and probability models will become increasingly more useful in the twenty-?rst century, as dif?cult new problems emerge, that will require more sophisticated models and analysis. Thisisa text onthe fundamentalsof thetheoryofprobabilityat anundergraduate or ?rst-year graduate level for students in science, engineering,and economics. The only mathematical background required is knowledge of univariate and multiva- ate calculus and basic linear algebra. The book covers all of the standard topics in basic probability, such as combinatorial probability, discrete and continuous distributions, moment generating functions, fundamental probability inequalities, the central limit theorem, and joint and conditional distributions of discrete and continuous random variables. But it also has some unique features and a forwa- looking feel.

This clear exposition begins with basic concepts and moves on to combination of events, dependent events and random variables, Bernoulli trials and the De Moivre-Laplace theorem, and more. Includes 150 problems, many with answers.

This book is intended as an introduction to Probability Theory and Mathematical Statistics for students in mathematics, the physical sciences, engineering, and related fields. It is based on the author’s 25 years of experience teaching probability and is squarely aimed at helping students overcome common difficulties in learning the subject. The focus of the book is an explanation of the theory, mainly by the use of many examples. Whenever possible, proofs of stated results are provided. All sections conclude with a short list of problems. The book also includes several optional sections on more advanced topics. This textbook would be ideal for use in a first course in Probability Theory. Contents: Probabilities Conditional Probabilities and Independence Random Variables and Their Distribution Operations on Random Variables Expected Value, Variance, and Covariance Normally Distributed Random Vectors Limit Theorems Mathematical Statistics Appendix Bibliography Index

A concise introduction covering all of the measure theory and probability most useful for statisticians.

Compactly written, but nevertheless very readable, appealing to intuition, this introduction to probability theory is an excellent textbook for a one-semester course for undergraduates in any direction that uses probabilistic ideas. Technical machinery is only introduced when necessary. The route is rigorous but does not use measure theory. The text is illustrated with many original and surprising examples and problems taken from classical applications like gambling, geometry or graph theory, as well as from applications in biology, medicine, social sciences, sports, and coding theory. Only first-year calculus is required.

Introductory Probability is a pleasure to read and provides a fine answer to the question: How do you construct Brownian motion from scratch, given that you are a competent analyst? There are at least two ways to develop probability theory. The more familiar path is to treat it as its own discipline, and work from intuitive examples such as coin flips and conundrums such as the Monty Hall problem. An alternative is to first develop measure theory and analysis, and then add interpretation. Bhattacharya and Waymire take the second path.

This book provides an introduction to those parts of analysis that are most useful in applications for graduate students. The material is selected for use in applied problems, and is presented clearly and simply but without sacrificing mathematical rigor. The text is accessible to students from a wide variety of backgrounds, including undergraduate students entering applied mathematics from non--mathematical fields and graduate students in the sciences and engineering who want to learn analysis. A basic background in calculus, linear algebra and ordinary differential equations, as well as some familiarity with functions and sets, should be sufficient.

This compact volume equips the reader with all the facts and principles essential to a fundamental understanding of the theory of probability. It is an introduction, no more: throughout the book the authors discuss the theory of probability for situations having only a finite number of possibilities, and the mathematics employed is held to the elementary level. But within its purposely restricted range it is extremely thorough, well organized, and absolutely authoritative. It is the only English translation of the latest revised Russian edition; and it is the only current translation on the market that has been checked and approved by Gnedenko himself. After explaining in simple terms the meaning of the concept of probability and the means by which an event is declared to be in practice, impossible, the authors take up the processes involved in the calculation of probabilities. They survey the rules for addition and multiplication of probabilities, the concept of conditional probability, the formula for total probability, Bayes's formula, Bernoulli's scheme and theorem, the concepts of random variables, insufficiency of the mean value for the characterization of a random variable, methods of measuring the variance of a random variable, theorems on the standard deviation, the Chebyshev inequality, normal laws of distribution, distribution curves, properties of normal distribution curves, and related topics. The book is unique in that, while there are several high school and college textbooks available on this subject, there is no other popular treatment for the layman that contains quite the same material presented with the same degree of clarity and authenticity. Anyone who desires a fundamental grasp of this increasingly important subject cannot do better than to start with this book. New preface for Dover edition by B. V. Gnedenko.

This textbook on the theory of probability starts from the premise that rather than being a purely mathematical discipline, probability theory is an intimate companion of statistics. The book starts with the basic tools, and goes on to cover a number of subjects in detail, including chapters on inequalities, characteristic functions and convergence. This is followed by explanations of the three main subjects in probability: the law of large numbers, the central limit theorem, and the law of the iterated logarithm. After a discussion of generalizations and extensions, the book concludes with an extensive chapter on martingales.

This book presents a selection of topics from probability theory. Essentially, the topics chosen are those that are likely to be the most useful to someone planning to pursue research in the modern theory of stochastic processes. The prospective reader is assumed to have good mathematical maturity. In particular, he should have prior exposure to basic probability theory at the level of, say, K.L. Chung's 'Elementary probability theory with stochastic processes' (Springer-Verlag, 1974) and real and functional analysis at the level of Royden's 'Real analysis' (Macmillan, 1968). The first chapter is a rapid overview of the basics. Each subsequent chapter deals with a separate topic in detail. There is clearly some selection involved and therefore many omissions, but that cannot be helped in a book of this size. The style is deliberately terse to enforce active learning. Thus several tidbits of deduction are left to the reader as labelled exercises in the main text of each chapter. In addition, there are supplementary exercises at the end. In the preface to his classic text on probability ('Probability', Addison Wesley, 1968), Leo Breiman speaks of the right and left hands of probability.

Introduction to Probability Models, Tenth Edition, provides an introduction to elementary probability theory and stochastic processes. There are two approaches to the study of probability theory. One is heuristic and nonrigorous, and attempts to develop in students an intuitive feel for the subject that enables him or her to think probabilistically. The other approach attempts a rigorous development of probability by using the tools of measure theory. The first approach is employed in this text. The book begins by introducing basic concepts of probability theory, such as the random variable, conditional probability, and conditional expectation. This is followed by discussions of stochastic processes, including Markov chains and Poison processes. The remaining chapters cover queuing, reliability theory, Brownian motion, and simulation. Many examples are worked out throughout the text, along with exercises to be solved by students. This book will be particularly useful to those interested in learning how probability theory can be applied to the study of phenomena in fields such as engineering, computer science, management science, the physical and social sciences, and operations research. Ideally, this text would be used in a one-year course in probability models, or a one-semester course in introductory probability theory or a course in elementary stochastic processes. New to this Edition: 65% new chapter material including coverage of finite capacity queues, insurance risk models and Markov chains Contains compulsory material for new Exam 3 of the Society of Actuaries containing several sections in the new exams Updated data, and a list of commonly used notations and equations, a robust ancillary package, including a ISM, SSM, and test bank Includes SPSS PASW Modeler and SAS JMP software packages which are widely used in the field Hallmark features: Superior writing style Excellent exercises and examples covering the wide breadth of coverage of probability topics Real-world applications in engineering, science, business and economics

Leads the student through the standard material for probability theory, with stops along the way for interesting topics such as statistical mechanics, not usually covered in a book for beginners. Covers independent identical trials and the law of large numbers, De Moivre-Laplace and Poisson limit th

This introduction to more advanced courses in probability and real analysis emphasizes the probabilistic way of thinking, rather than measure-theoretic concepts. Geared toward advanced undergraduates and graduate students, its sole prerequisite is calculus. Taking statistics as its major field of application, the text opens with a review of basic concepts, advancing to surveys of random variables, the properties of expectation, conditional probability and expectation, and characteristic functions. Subsequent topics include infinite sequences of random variables, Markov chains, and an introduction to statistics. Complete solutions to some of the problems appear at the end of the book.

Since the publication of the first edition of this classic textbook over thirty years ago, tens of thousands of students have used A Course in Probability Theory. New in this edition is an introduction to measure theory that expands the market, as this treatment is more consistent with current courses. While there are several books on probability, Chung's book is considered a classic, original work in probability theory due to its elite level of sophistication.

The book covers basic concepts such as random experiments, probability axioms, conditional probability, and counting methods, single and multiple random variables (discrete, continuous, and mixed), as well as moment-generating functions, characteristic functions, random vectors, and inequalities; limit theorems and convergence; introduction to Bayesian and classical statistics; random processes including processing of random signals, Poisson processes, discrete-time and continuous--time Markov chains, and Brownian motion; simulation using MATLAB and R.

A one-year course in probability theory and the theory of random processes, taught at Princeton University to undergraduate and graduate students, forms the core of this book. It provides a comprehensive and self-contained exposition of classical probability theory and the theory of random processes. The book includes detailed discussion of Lebesgue integration, Markov chains, random walks, laws of large numbers, limit theorems, and their relation to Renormalization Group theory. It also includes the theory of stationary random processes, martingales, generalized random processes, and Brownian motion.

This book provides a first introduction to the methods of probability theory by using the modern and rigorous techniques of measure theory and functional analysis. It is geared for undergraduate students, mainly in mathematics and physics majors, but also for students from other subject areas such as economics, finance and engineering. It is an invaluable source, either for a parallel use to a related lecture or for its own purpose of learning it.The first part of the book gives a basic introduction to probability theory. It explains the notions of random events and random variables, probability measures, expectation values, distributions, characteristic functions, independence of random variables, as well as different types of convergence and limit theorems. The first part contains two chapters. The first chapter presents combinatorial aspects of probability theory, and the second chapter delves into the actual introduction to probability theory, which contains the modern probability language. The second part is devoted to some more sophisticated methods such as conditional expectations, martingales and Markov chains. These notions will be fairly accessible after reading the first part.

Sinai's book leads the student through the standard material for ProbabilityTheory, with stops along the way for interesting topics such as statistical mechanics, not usually included in a book for beginners. The first part of the book covers discrete random variables, using the same approach, basedon Kolmogorov's axioms for probability, used later for the general case. The text is divided into sixteen lectures, each covering a major topic. The introductory notions and classical results are included, of course: random variables, the central limit theorem, the law of large numbers, conditional probability, random walks, etc. Sinai's style is accessible and clear, with interesting examples to accompany new ideas. Besides statistical mechanics, other interesting, less common topics found in the book are: percolation, the concept of stability in the central limit theorem and the study of probability of large deviations. Little more than a standard undergraduate course in analysis is assumed of the reader. Notions from measure theory and Lebesgue integration are introduced in the second half of the text. The book is suitable for second or third year students in mathematics, physics or other natural sciences. It could also be usedby more advanced readers who want to learn the mathematics of probability theory and some of its applications in statistical physics.

The founder of Hungary's Probability Theory School, A. Rényi made significant contributions to virtually every area of mathematics. This introductory text is the product of his extensive teaching experience and is geared toward readers who wish to learn the basics of probability theory, as well as those who wish to attain a thorough knowledge in the field. Based on the author's lectures at the University of Budapest, this text requires no preliminary knowledge of probability theory. Readers should, however, be familiar with other branches of mathematics, including a thorough understanding of the elements of the differential and integral calculus and the theory of real and complex functions. These well-chosen problems and exercises illustrate the algebras of events, discrete random variables, characteristic functions, and limit theorems. The text concludes with an extensive appendix that introduces information theory.

In the past half-century the theory of probability has grown from a minor isolated theme into a broad and intensive discipline interacting with many other branches of mathematics. At the same time it is playing a central role in the mathematization of various applied sciences such as statistics, opera tions research, biology, economics and psychology-to name a few to which the prefix "mathematical" has so far been firmly attached. The coming-of-age of probability has been reflected in the change of contents of textbooks on the subject. In the old days most of these books showed a visible split personality torn between the combinatorial games of chance and the so-called "theory of errors" centering in the normal distribution. This period ended with the appearance of Feller's classic treatise (see [Feller I]t) in 1950, from the manuscript of which I gave my first substantial course in probability. With the passage of time probability theory and its applications have won a place in the college curriculum as a mathematical discipline essential to many fields of study. The elements of the theory are now given at different levels, sometimes even before calculus. The present textbook is intended for a course at about the sophomore level. It presupposes no prior acquaintance with the subject and the first three chapters can be read largely without the benefit of calculus.

This title is a Pearson Global Edition. The Editorial team at Pearson has worked closely with educators around the world to include content which is especially relevant to students outside the United States. For upper-level to graduate courses in Probability or Probability and Statistics, for majors in mathematics, statistics, engineering, and the sciences. Explores both the mathematics and the many potential applications of probability theory 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 an introduction to probability theory using measure theory. This work provides proofs of the essential introductory results and presents the measure theory and mathematical details in terms of intuitive probabilistic concepts, rather than as separate, imposing subjects.

This text is designed for an introductory probability course at the university level for sophomores, juniors, and seniors in mathematics, physical and social sciences, engineering, and computer science. It presents a thorough treatment of ideas and techniques necessary for a firm understanding of the subject. The text is also recommended for use in discrete probability courses. The material is organized so that the discrete and continuous probability discussions are presented in a separate, but parallel, manner. This organization does not emphasize an overly rigorous or formal view of probability and therefore offers some strong pedagogical value. Hence, the discrete discussions can sometimes serve to motivate the more abstract continuous probability discussions. Features: Key ideas are developed in a somewhat leisurely style, providing a variety of interesting applications to probability and showing some nonintuitive ideas. Over 600 exercises provide the opportunity for practicing skills and developing a sound understanding of ideas. Numerous historical comments deal with the development of discrete probability. The text includes many computer programs that illustrate the algorithms or the methods of computation for important problems. The book is a beautiful introduction to probability theory at the beginning level. The book contains a lot of examples and an easy development of theory without any sacrifice of rigor, keeping the abstraction to a minimal level. It is indeed a valuable addition to the study of probability theory. --Zentralblatt MATH