

Lang Undergraduate Analysis

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Primer of Modern Analysis Springer Science & Business Media

A text for a first graduate course in real analysis for students in pure and applied mathematics, statistics, education, engineering, and economics.

Mathematical Analysis I Springer Science & Business Media

Originally published in 2010, reissued as part of Pearson's modern classic series.

Undergraduate Analysis Springer Science & Business Media

From the reviews "This is a reprint of the original edition of Lang's 'A First Course in Calculus', which was first published in 1964....The treatment is 'as rigorous as any mathematician would wish it'[The exercises] are refreshingly simply stated, without any extraneous verbiage, and at times quite challenging....There are answers to all the exercises set and some supplementary problems on each topic to tax even the most able."

--Mathematical Gazette

Springer Science & Business Media

SL₂(R) gives the student an introduction to the infinite dimensional representation theory of semisimple Lie groups by concentrating on one example - *SL₂(R)*. This field is of interest not only for its own sake, but for its connections with other areas such as number theory, as brought out, for example, in the work of Langlands. The rapid development of representation theory over the past 40 years has made it increasingly difficult for a student to enter the field. This book makes the theory accessible to a wide audience, its only prerequisites being a knowledge of real analysis, and some differential equations.

Complex Analysis in one Variable Springer Science & Business Media

"Advanced Calculus is intended as a text for courses that furnish the backbone of the student's undergraduate education in mathematical analysis. The goal is to rigorously present the fundamental concepts within the context of illuminating examples and stimulating exercises. This book is self-contained and starts with the creation of basic tools

using the completeness axiom. The continuity, differentiability, integrability, and power series representation properties of functions of a single variable are established. The next few chapters describe the topological and metric properties of Euclidean space. These are the basis of a rigorous treatment of differential calculus (including the Implicit Function Theorem and Lagrange Multipliers) for mappings between Euclidean spaces and integration for functions of several real variables."--pub. desc.

A Course in Mathematical Analysis Springer Science & Business Media

This book discusses some of the first principles of modern analysis. It can be used for courses at several levels, depending upon the background and ability of the students. It was written on the premise that today's good students have unexpected enthusiasm and nerve. When hard work is put to them, they work harder and ask for more. The honors course (at the University of Wisconsin) which inspired this book was, I think, more fun than the book itself. And better. But then there is acting in teaching, and a typewriter is a poor substitute for an audience. The spontaneous, creative disorder that characterizes an exciting course becomes silly in a book. To write, one must cut and dry. Yet, I hope enough of the spontaneity, enough of the spirit of that course, is left to enable those using the book to create exciting courses of their own. Exercises in this book are not designed for drill. They are designed to clarify the meanings of the theorems, to force an understanding of the proofs, and to call attention to points in a proof that might otherwise be overlooked. The exercises, therefore, are a real part of the theory, not a collection of side issues, and as such nearly all of them are to be done. Some drill is, of course, necessary, particularly in the calculation of integrals.

Postmodern Analysis Springer Science & Business Media

For many years, Serge Lang has given talks on selected items in mathematics which could be extracted at a level understandable by those who have had calculus. Written in a conversational tone, Lang now presents a collection of those talks as a book covering such topics as: prime numbers, the abc conjecture, approximation theorems of analysis, Bruhat-Tits spaces, and harmonic and symmetric polynomials. Each talk is written in a lively and informal style meant to engage any reader looking for further insight into mathematics.

Real Analysis Springer Science & Business Media

This book is meant as a text for a first-year graduate course in analysis. In a sense, it covers the same topics as elementary calculus but treats them in a manner suitable for people who will be using it in further mathematical investigations. The organization avoids long chains of logical interdependence, so that chapters are mostly independent. This allows a course to omit material from some chapters without compromising the exposition of material from later chapters.

The Way of Analysis Cambridge University Press

This logically self-contained introduction to analysis centers around those properties that have to do with uniform convergence and uniform limits in the context of differentiation and integration. From the reviews: "This material can be gone over quickly by the really well-prepared reader, for it is one of the book's pedagogical strengths that the pattern of development later recapitulates this material as it deepens and generalizes it." --AMERICAN

MATHEMATICAL SOCIETY

Algebra Jones & Bartlett Learning

An authorised reissue of the long out of print classic textbook, *Advanced Calculus* by the late Dr Lynn Loomis and Dr

Shlomo Sternberg both of Harvard University has been a revered but hard to find textbook for the advanced calculus course for decades. This book is based on an honors course in advanced calculus that the authors gave in the 1960's. The foundational material, presented in the unstarred sections of Chapters 1 through 11, was normally covered, but different applications of this basic material were stressed from year to year, and the book therefore contains more material than was covered in any one year. It can accordingly be used (with omissions) as a text for a year's course in advanced calculus, or as a text for a three-semester introduction to analysis. The prerequisites are a good grounding in the calculus of one variable from a mathematically rigorous point of view, together with some acquaintance with linear algebra. The reader should be familiar with limit and continuity type arguments and have a certain amount of mathematical sophistication. As possible introductory texts, we mention Differential and Integral Calculus by R Courant, Calculus by T Apostol, Calculus by M Spivak, and Pure Mathematics by G Hardy. The reader should also have some experience with partial derivatives. In overall plan the book divides roughly into a first half which develops the calculus (principally the differential calculus) in the setting of normed vector spaces, and a second half which deals with the calculus of differentiable manifolds.

SL2(R) Springer

This book is based on a first-year graduate course I gave three times at the University of Chicago. As it was addressed to graduate students who intended to specialize in mathematics, I tried to put the classical theory of functions of a complex variable in context, presenting proofs and points of view which relate the subject to other branches of mathematics. Complex analysis in one variable is ideally suited to this attempt. Of course, the branches of mathematics one chooses, and the connections one makes, must depend on personal taste and knowledge. My own leaning towards several complex variables will be apparent, especially in the notes at the end of the different chapters. The first three chapters deal largely with classical material which is available in the many books on the subject. I have tried to present this material as efficiently as I could, and, even here, to show the relationship with other branches of mathematics. Chapter 4 contains a proof of Picard's theorem; the method of proof I have chosen has far-reaching generalizations in several complex variables and in differential geometry. The next two chapters deal with the Runge approximation theorem and its many applications. The presentation here has been strongly influenced by work on several complex variables.

Real and Functional Analysis Oxford University Press

This new, revised edition covers all of the basic topics in calculus of several variables, including vectors, curves, functions of several variables, gradient, tangent plane, maxima and minima, potential functions, curve integrals, Green's theorem, multiple integrals, surface integrals, Stokes' theorem, and the inverse mapping theorem and its consequences. It includes many completely worked-out problems.

Undergraduate Analysis Springer Science & Business Media

The companion title, Linear Algebra, has sold over 8,000 copies The writing style is very accessible The material can be covered easily in a one-year or one-term course Includes Noah Snyder's proof of the Mason-Stothers polynomial abc theorem New material included on product structure for matrices including descriptions of the conjugation representation of the diagonal group

Analysis I Springer

The present book is meant as a text for a course on complex analysis at the advanced undergraduate level, or first-year graduate level. Somewhat more material has been included than can be covered at leisure in one term, to give opportunities for the instructor to exercise his taste, and lead the course in whatever direction strikes his fancy at the time. A large number of routine exercises are included for the more standard portions, and a few harder exercises of striking theoretical interest are also included, but may be omitted in courses addressed to less advanced students. In some sense, I think the classical German prewar texts were the best (Hurwitz-Courant, Knopp, Bieberbach, etc.) and I would recommend to anyone to look through them. More recent texts have emphasized connections with real analysis, which is important, but at the cost of exhibiting succinctly and clearly what is peculiar about complex analysis: the power series expansion, the uniqueness of analytic continuation, and the calculus of residues. The systematic

elementary development of formal and convergent power series was standard fare in the German texts, but only Cartan, in the more recent books, includes this material, which I think is quite essential, e. g. , for differential equations. I have written a short text, exhibiting these features, making it applicable to a wide variety of tastes. The book essentially decomposes into two parts.

Problems in Real Analysis Springer Science & Business Media

What is the title of this book intended to signify, what connotations is the adjective "Postmodern" meant to carry? A potential reader will surely pose this question. To answer it, I should describe what distinguishes the approach to analysis presented here from what has been called "Modern Analysis" by its protagonists.

"Modern Analysis" as represented in the works of the Bourbaki group or in the textbooks by Jean Dieudonné is characterized by its systematic and axiomatic treatment and by its drive towards a high level of abstraction. Given the tendency of many prior treatises on analysis to degenerate into a collection of rather unconnected tricks to solve special problems, this definitively represented a healthy achievement. In any case, for the development of a consistent and powerful mathematical theory, it seems to be necessary to concentrate solely on the internal problems and structures and to neglect the relations to other fields of scientific, even of mathematical study for a certain while. Almost complete isolation may be required to reach the level of intellectual elegance and perfection that only a good mathematical theory can acquire. However, once this level has been reached, it might be useful to open one's eyes again to the inspiration coming from concrete external problems.

Solutions Manual for Lang's Linear Algebra Springer Science & Business Media

Mathematics is the music of science, and real analysis is the Bach of mathematics. There are many other foolish things I could say about the subject of this book, but the foregoing will give the reader an idea of where my heart lies. The present book was written to support a first course in real analysis, normally taken after a year of elementary calculus. Real analysis is, roughly speaking, the modern setting for Calculus, "real" alluding to the field of real numbers that underlies it all. At center stage are functions, defined and taking values in sets of real numbers or in sets (the plane, 3-space, etc.) readily derived from the real numbers; a first course in real analysis traditionally places the emphasis on real-valued functions defined on sets of real numbers. The agenda for the course: (1) start with the axioms for the field of real numbers, (2) build, in one semester and with appropriate rigor, the foundations of calculus (including the "Fundamental Theorem"), and, along the way, (3) develop those skills and attitudes that enable us to continue learning mathematics on our own. Three decades of experience with the exercise have not diminished my astonishment that it can be done.

Mathematical Analysis Math Classics

The present volume is a text designed for a first course in analysis. Although it is logically self-contained, it presupposes the mathematical maturity acquired by students who will ordinarily have had two years of calculus. When used in this context, most of the first part can be omitted, or reviewed extremely rapidly, or left to the students to read by themselves. The course can proceed immediately into Part Two after covering Chapters 0 and 1. However, the techniques of Part One are precisely those which are not emphasized in elementary calculus courses, since they are regarded as too sophisticated. The context of a third-year course is the first time that they are given proper emphasis, and thus it is important that Part One be thoroughly mastered. Emphasis has shifted from computational aspects of calculus to theoretical aspects: proofs for theorems concerning continuous functions; sketching curves like $x e^{-x}$, $x \log x$, $x \log x$ which are usually regarded as too difficult for the more elementary courses; and other similar matters.

A First Course in Real Analysis Springer Science & Business Media

Author is well-known and established book author (all Serge Lang books are now published by

Springer); Presents a brief introduction to the subject; All manifolds are assumed finite dimensional in order not to frighten some readers; Complete proofs are given; Use of manifolds cuts across disciplines and includes physics, engineering and economics

A First Course in Calculus World Scientific Publishing Company

All the exercises plus their solutions for Serge Lang's fourth edition of "Complex Analysis," ISBN 0-387-98592-1. The problems in the first 8 chapters are suitable for an introductory course at undergraduate level and cover power series, Cauchy's theorem, Laurent series, singularities and meromorphic functions, the calculus of residues, conformal mappings, and harmonic functions. The material in the remaining 8 chapters is more advanced, with problems on Schwartz reflection, analytic continuation, Jensen's formula, the Phragmen-Lindelof theorem, entire functions, Weierstrass products and meromorphic functions, the Gamma function and Zeta function. Also beneficial for anyone interested in learning complex analysis.

An Introduction to Modern Analysis Addison-Wesley

Examining the basic principles in real analysis and their applications, this text provides a self-contained resource for graduate and advanced undergraduate courses. It contains independent chapters aimed at various fields of application, enhanced by highly advanced graphics and results explained and supplemented with practical and theoretical exercises. The presentation of the book is meant to provide natural connections to classical fields of applications such as Fourier analysis or statistics. However, the book also covers modern areas of research, including new and seminal results in the area of functional analysis.