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Introduction to Symplectic Topology Cambridge University Press

An Introduction to Manifolds Springer Science & Business Media

An Introductory Course on Differentiable Manifolds Springer Science & Business Media
Introducing the tools of modern differential geometry--exterior calculus, manifolds, vector bundles, connections--this textbook covers both classical surface theory, the modern theory of connections, and curvature. With no knowledge of topology assumed, the only prerequisites are multivariate calculus and linear algebra.

Introduction to Statistics and Data Analysis Springer Science & Business Media
This text on analysis of Riemannian manifolds is aimed at students who have had a first course in differentiable manifolds.

Analysis On Manifolds Springer Science & Business Media
A short introduction ideal for students learning category theory for the first time.

An Introduction To Differential Manifolds Springer
A readable introduction to the subject of calculus on arbitrary surfaces or manifolds. Accessible to readers with knowledge of basic calculus and linear algebra. Sections include series of problems to reinforce concepts.

Applied Differential Geometry Springer
Differential Geometry of Manifolds, Second Edition presents the extension of differential geometry from curves and surfaces to manifolds in general. The book provides a broad introduction to the field of differentiable and Riemannian manifolds, tying together classical and modern formulations. It introduces manifolds in a both streamlined and mathematically rigorous way while keeping a view toward applications, particularly in physics. The author takes a practical approach, containing extensive exercises and focusing on applications, including the Hamiltonian formulations of mechanics, electromagnetism, string theory. The Second Edition of this successful textbook offers several notable points of revision. New to the Second Edition: New problems have been added and the level of challenge has been changed to the exercises Each section corresponds to a 60-minute lecture period, making it more user-friendly for lecturers Includes new sections which provide more comprehensive coverage of topics Features a new chapter on Multilinear Algebra

The Laplacian on a Riemannian Manifold Springer Science & Business Media
Manifolds, the higher-dimensional analogs of smooth curves and surfaces, are fundamental objects in modern mathematics. Combining aspects of algebra, topology, and analysis, manifolds have also been applied to classical mechanics, general relativity, and quantum field theory. In this streamlined introduction to the subject, the theory of manifolds is presented with the aim of helping the reader achieve a rapid mastery of the essential topics. By the end of the book the reader should be able to compute, at least for simple spaces, one of the most basic topological invariants of a manifold, its de Rham cohomology. Along the way, the reader acquires the knowledge and skills necessary for further study of geometry and topology. The requisite point-set topology is included in an appendix of twenty pages; other appendices review facts from real analysis and linear algebra. Hints and solutions are provided to many of the exercises and problems. This work may be used as the text for a one-semester graduate or advanced undergraduate course, as well as by students engaged in self-study. Requiring only minimal undergraduate prerequisites, 'Introduction to Manifolds' is also an excellent foundation for Springer's GTM 82, 'Differential Forms in Algebraic Topology'.

An Introduction to Analysis on Manifolds Oxford University Press
Developed from a first-year graduate course in algebraic topology, this text is an informal introduction to some of the main ideas of contemporary homotopy and cohomology theory. The materials are structured around four core areas: de Rham theory, the Cech-de Rham complex, spectral sequences, and characteristic classes. By using the de Rham theory of differential forms as a prototype of cohomology, the machineries of algebraic topology are

made easier to assimilate. With its stress on concreteness, motivation, and readability, this book is equally suitable for self-study and as a one-semester course in topology.

An Introduction to Manifolds Springer Science & Business Media
Author has written several excellent Springer books.; This book is a sequel to Introduction to Topological Manifolds; Careful and illuminating explanations, excellent diagrams and exemplary motivation; Includes short preliminary sections before each section explaining what is ahead and why

An Introduction to Differentiable Manifolds and Riemannian Geometry, Revised Cambridge University Press
This introductory statistics textbook conveys the essential concepts and tools needed to develop and nurture statistical thinking. It presents descriptive, inductive and explorative statistical methods and guides the reader through the process of quantitative data analysis. In the experimental sciences and interdisciplinary research, data analysis has become an integral part of any scientific study. Issues such as judging the credibility of data, analyzing the data, evaluating the reliability of the obtained results and finally drawing the correct and appropriate conclusions from the results are vital. The text is primarily intended for undergraduate students in disciplines like business administration, the social sciences, medicine, politics, macroeconomics, etc. It features a wealth of examples, exercises and solutions with computer code in the statistical programming language R as well as supplementary material that will enable the reader to quickly adapt all methods to their own applications.

Differential Geometry American Mathematical Soc.
This book uses elementary versions of modern methods found in sophisticated mathematics to discuss portions of "advanced calculus" in which the subtlety of the concepts and methods makes rigor difficult to attain at an elementary level.

Differential Forms and Connections CRC Press
This book provides an introduction to the basic concepts in differential topology, differential geometry, and differential equations, and some of the main basic theorems in all three areas. This new edition includes new chapters, sections, examples, and exercises. From the reviews: "There are many books on the fundamentals of differential geometry, but this one is quite exceptional; this is not surprising for those who know Serge Lang's books." --EMS NEWSLETTER

Introduction to Topological Manifolds Springer
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

With Exercises, Solutions and Applications in R Cambridge University Press
A famous Swiss professor gave a student's course in Basel on Riemann surfaces. After a couple of lectures, a student asked him, "Professor, you have as yet not given an exact de nition of a Riemann surface." The professor answered, "With Riemann surfaces, the main thing is to UNDERSTAND them, not to de ne them." The student's objection was reasonable. From a formal viewpoint, it is of course necessary to start as soon as possible with strict de nitions, but the professor's- swer also has a substantial background. The pure de nition of a Riemann surface— as a complex 1-dimensional complex analytic manifold—contributes little to a true understanding. It takes a long time to really be familiar with what a Riemann s- face is. This example is typical for the objects of global analysis—manifolds with str- tures. There are complex concrete de nitions but these do not automatically explain what they really are, what we can do with them, which operations they really admit, how rigid they are. Hence, there arises the natural question—how to attain a deeper understanding? One well-known way to gain an understanding is through underpinning the d- nitions, theorems and constructions with hierarchies of examples, counterexamples and exercises. Their choice, construction and logical order is for any teacher in global analysis an interesting, important and fun creating task.

Basic Category Theory Cambridge University Press
This book is intended as an elementary introduction to differential manifolds. The authors concentrate on the intuitive geometric aspects and explain not only the basic properties but also teach how to do the basic geometrical constructions. An integral part of the work are the many diagrams which illustrate the proofs. The text is liberally supplied with exercises and will be welcomed by students with some basic knowledge of analysis and topology.

Revised Courier Dover Publications
Differential Topology provides an elementary and intuitive introduction to the study of smooth

manifolds. In the years since its first publication, Guillemin and Pollack's book has become a standard text on the subject. It is a jewel of mathematical exposition, judiciously picking exactly the right mixture of detail and generality to display the richness within. The text is mostly self-contained, requiring only undergraduate analysis and linear algebra. By relying on a unifying idea--transversality--the authors are able to avoid the use of big machinery or ad hoc techniques to establish the main results. In this way, they present intelligent treatments of important theorems, such as the Lefschetz fixed-point theorem, the Poincaré-Hopf index theorem, and Stokes theorem. The book has a wealth of exercises of various types. Some are routine explorations of the main material. In others, the students are guided step-by-step through proofs of fundamental results, such as the Jordan-Brouwer separation theorem. An exercise section in Chapter 4 leads the student through a construction of de Rham cohomology and a proof of its homotopy invariance. The book is suitable for either an introductory graduate course or an advanced undergraduate course.

Introduction to Differentiable Manifolds Springer
Based on author Siavash Shahshahani's extensive teaching experience, this volume presents a thorough, rigorous course on the theory of differentiable manifolds. Geared toward advanced undergraduates and graduate students in mathematics, the treatment's prerequisites include a strong background in undergraduate mathematics, including multivariable calculus, linear algebra, elementary abstract algebra, and point set topology. More than 200 exercises offer students ample opportunity to gauge their skills and gain additional insights. The four-part treatment begins with a single chapter devoted to the tensor algebra of linear spaces and their mappings. Part II brings in neighboring points to explore integrating vector fields, Lie bracket, exterior derivative, and Lie derivative. Part III, involving manifolds and vector bundles, develops the main body of the course. The final chapter provides a glimpse into geometric structures by introducing connections on the tangent bundle as a tool to implant the second derivative and the derivative of vector fields on the base manifold. Relevant historical and philosophical asides enhance the mathematical text, and helpful Appendices offer supplementary material.

A Visual Introduction to Differential Forms and Calculus on Manifolds Cambridge University Press
Manifolds play an important role in topology, geometry, complex analysis, algebra, and classical mechanics. Learning manifolds differs from most other introductory mathematics in that the subject matter is often completely unfamiliar. This introduction guides readers by explaining the roles manifolds play in diverse branches of mathematics and physics. The book begins with the basics of general topology and gently moves to manifolds, the fundamental group, and covering spaces.

Riemannian Manifolds Springer Science & Business Media
Ricci flow is a powerful analytic method for studying the geometry and topology of manifolds. This book is an introduction to Ricci flow for graduate students and mathematicians interested in working in the subject. To this end, the first chapter is a review of the relevant basics of Riemannian geometry. For the benefit of the student, the text includes a number of exercises of varying difficulty. The book also provides brief introductions to some general methods of geometric analysis and other geometric flows. Comparisons are made between the Ricci flow and the linear heat equation, mean curvature flow, and other geometric evolution equations whenever possible. Several topics of Hamilton's program are covered, such as short time existence, Harnack inequalities, Ricci solitons, Perelman's no local collapsing theorem, singularity analysis, and ancient solutions. A major direction in Ricci flow, via Hamilton's and Perelman's works, is the use of Ricci flow as an approach to solving the Poincare conjecture and Thurston's geometrization conjecture.

Geometry of Differential Forms Springer Science & Business Media
In this streamlined introduction to the subject, the theory of manifolds is presented with the aim of helping the reader achieve a rapid mastery of the essential topics. By the end of the book the reader should be able to compute, at least for simple spaces, one of the most basic topological invariants of a manifold, its de Rham cohomology. Along the way the reader acquires the knowledge and skills necessary for further study of geometry and topology. The requisite point-set topology is included in an appendix of twenty pages, while other appendices review facts from real analysis and linear algebra. Hints and solutions are provided to many of the exercises and problems.