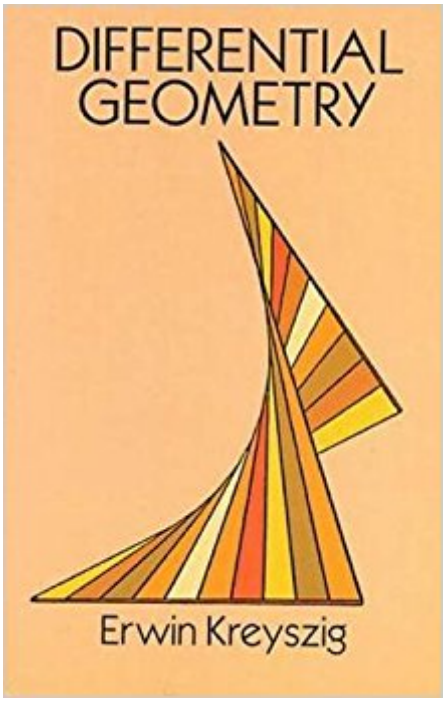
Differential Geometry (Dover Books On Mathematics)



Synopsis

An introductory textbook on the differential geometry of curves and surfaces in three-dimensional Euclidean space, presented in its simplest, most essential form, but with many explanatory details, figures and examples, and in a manner that conveys the theoretical and practical importance of the different concepts, methods and results involved. With problems at the end of each section, and solutions listed at the end of the book. Includes 99 illustrations.

Book Information

Series: Dover Books on Mathematics

Paperback: 384 pages

Publisher: Dover Publications; 1st edition (June 1, 1991)

Language: English

ISBN-10: 0486667219

ISBN-13: 978-0486667218

Product Dimensions: 0.8 x 5.5 x 8.5 inches

Shipping Weight: 12.8 ounces (View shipping rates and policies)

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Customer Reviews

I had been seeking a book on differential geometry for self-study, as a preface to learning general relativity. A seasoned mathematics friend recommended Kreyszig.So, I waded in, and patiently made my way through every page of the first six chapters, working the problems along the way, at a pace of a few pages per day. Now that the journey is behind me, I can say that I appreciated this book. It compares favorably to some other texts I had tried reading, with less success.I realize that the author’s approach is an old-style classical one, with a reliance on specific coordinate systems and transformations between coordinate systems. To work the problems requires a fair amount of paper and pencil work. Nonetheless, this approach worked well for me. On those occasions when my reading bogged down, inevitably there was a good reason. If I went back carefully, re-read and pondered, doodled on paper, and tried to visualize what Kreyszig was describing, it always worked! The light would soon go on, usually with a pleasurable sense of discovery.I went back to re-read certain sections of the book to refresh my memory, and realized how elegant the writing is. Crystal

clear, right to the heart, and always trustworthy. Everything follows in a gentle persuasive way; there are no jarring leaps or gaps.Additionally, I had a nice sense of the different flavor brought to the field by the French geometers who made many of the key advances around the turn of the 19th-20th century.Finally, the summary of key results and equations at the end is very smart and helpful.Since finishing Kreysig, I did find it helpful to push on and try to grasp these same ideas from the standpoint of one-forms and the coordinate-free approach to tensors.

I strongly recommend this book to anyone looking for an introduction to differential geometry. This book restricts its coverage to curves and surfaces in three dimensional Euclidean space, which is highly appropriate for a first book on the subject. Beyond that, nothing is held back. This book includes a self-contained introduction to tensorial methods in chapter two, and tensors are used heavily in the remainder of the book, which makes this book much more suitable for anyone interested in studying general relativity than a book that tries to limp through the same subject matter using only vector methods.In fact, all of the basic elements that are necessary for the study of general relativity are introduced in this book and in the simplest possible setting.This book includes exactly 99 figures and a large number of examples which are extremely helpful in understanding the material and as other reviewers have remarked has numerous exercises with full solutions in the back of the book. There is also a collection of formulae at the end which makes for a good review and enhances the book's usefulness as a reference.The definitions are explicit and the proofs are quite clear. However, the proofs do make references to the theory of differential equations and to results in complex variable theory in a couple of places.Downsides? While the exposition is excellent, it is a bit terse. Towards the end, there is a lot of flipping back to look at referenced earlier formulas. In addition, small steps are omitted from many derivations. Also, there is a section on the Bergman metric that seemed completely tangential to the rest of the material in the book.Here's a breakdown of the contents:Chapter 1 is preliminaries.

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