



Modern Differential Geometry of Curves and Surfaces with Mathematica, Second Edition

By Alfred Gray

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Modern Differential Geometry of Curves and Surfaces with Mathematica, Second Edition By Alfred Gray

The Second Edition combines a traditional approach with the symbolic manipulation abilities of Mathematica to explain and develop the classical theory of curves and surfaces. You will learn to reproduce and study interesting curves and surfaces - many more than are included in typical texts - using computer methods. By plotting geometric objects and studying the printed result, teachers and students can understand concepts geometrically and see the effect of changes in parameters.

Modern Differential Geometry of Curves and Surfaces with Mathematica explains how to define and compute standard geometric functions, for example the curvature of curves, and presents a dialect of Mathematica for constructing new curves and surfaces from old. The book also explores how to apply techniques from analysis.

Although the book makes extensive use of Mathematica, readers without access to that program can perform the calculations in the text by hand. While single- and multi-variable calculus, some linear algebra, and a few concepts of point set topology are needed to understand the theory, no computer or Mathematica skills are required to understand the concepts presented in the text. In fact, it serves as an excellent introduction to Mathematica, and includes fully documented programs written for use with Mathematica.

Ideal for both classroom use and self-study, Modern Differential Geometry of Curves and Surfaces with Mathematica has been tested extensively in the classroom and used in professional short courses throughout the world.

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Review

"I wish that I would have used this book as my introduction to differential geometry instead of the here-unnamed horror-flick-of-a-book required by my early professors on the subject. In the high-turnover of textbooks this much improved 2nd edition is truly deserving of the title and furthermore acts as an excellent tribute to its author." - The Mathematica Journal, Vol. 7 No. 2, 1998 "More than any other text I am aware of, Gray integrates computing into the material. Gray's Mathematica programs offer new and fascinating ways to present material. With an appropriate selection of material the first edition and, even better, the present second edition, may provide an excellent background for a course on the subject. The second edition provides considerable extensions of the subjects. The author's acknowledgements show that comments from a lot of well-known geometers have lead to an improvement of the book." --Bernd Wegner, Zentralblatt MATH, Vol. 942

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