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Nota di contenuto	Preface -- Introduction -- Part 1. A Rigorous Approach to Advanced Calculus -- 1. Preliminaries -- 2. Metric and Topological Spaces I -- 3. Multivariable Differential Calculus -- 4. Integration I: Multivariable Riemann Integral and Basic Ideas toward the Lebesgue Integral -- 5. Integration II: Measurable Functions, Measure and the Techniques of Lebesgue Integration -- 6. Systems of Ordinary Differential Equations -- 7. System of Linear Differential Equations -- 8. Line Integrals and Green's Theorem -- Part 2. Analysis and Geometry -- 9. An Introduction to Complex Analysis -- 10. Metric and Topological Spaces II -- 11. Multilinear Algebra -- 12. Smooth Manifolds, Differential

Forms and Stokes' Theorem -- 13. Calculus of Variations and the Geodesic Equation -- 14. Tensor Calculus and Riemannian Geometry -- 15. Hilbert Spaces I: Definitions and Basic Properties -- 16. Hilbert Spaces II: Examples and Applications -- Appendix A. Linear Algebra I: Vector Spaces -- Appendix B. Linear Algebra II: More about Matrices -- Bibliography -- Index of Symbols -- Index. .

Sommario/riassunto

The book begins at an undergraduate student level, assuming only basic knowledge of calculus in one variable. It rigorously treats topics such as multivariable differential calculus, the Lebesgue integral, vector calculus and differential equations. After having created a solid foundation of topology and linear algebra, the text later expands into more advanced topics such as complex analysis, differential forms, calculus of variations, differential geometry and even functional analysis. Overall, this text provides a unique and well-rounded introduction to the highly developed and multi-faceted subject of mathematical analysis as understood by mathematicians today.