Record Nr. UNINA9910789213403321 Autore Do Carmo Manfredo P **Titolo** Differential Forms and Applications [[electronic resource] /] / by Manfredo P. Do Carmo Pubbl/distr/stampa Berlin, Heidelberg:,: Springer Berlin Heidelberg:,: Imprint: Springer, 1994 **ISBN** 3-642-57951-5 Edizione [1st ed. 1994.] Descrizione fisica 1 online resource (X, 118 p.) Collana Universitext,, 0172-5939 Disciplina 515/.37 Soggetti Differential geometry Mathematical analysis Analysis (Mathematics) Mathematical physics **Physics Differential Geometry Analysis** Theoretical, Mathematical and Computational Physics Mathematical Methods in Physics Numerical and Computational Physics, Simulation Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Note generali Bibliographic Level Mode of Issuance: Monograph Nota di bibliografia Includes bibliographical references (page 115) and index. Nota di contenuto 1. Differential Forms in Rn -- 2. Line Integrals -- 3. Differentiable Manifolds -- 4. Integration on Manifolds: Stokes Theorem and Poincaré's Lemma -- 1. Integration of Differential Forms -- 2. Stokes Theorem -- 3. Poincaré's Lemma -- 5. Differential Geometry of Surfaces -- 1. The Structure Equations of Rn -- 2. Surfaces in R3 -- 3. Intrinsic Geometry of Surfaces -- 6. The Theorem of Gauss-Bonnet and the Theorem of Morse -- 1. The Theorem of Gauss-Bonnet -- 2. The Theorem of Morse -- References. Sommario/riassunto This is a free translation of a set of notes published originally in Portuguese in 1971. They were translated for a course in the College of Differential Geome- try, ICTP, Trieste, 1989. In the English translation we omitted a chapter on the Frobenius theorem and an appendix on

the nonexistence of a complete hyperbolic plane in euclidean 3-space

(Hilbert's theorem). For the present edition, we introduced a chapter on line integrals. In Chapter 1 we introduce the differential forms in Rn. We only assume an elementary knowledge of calculus, and the chapter can be used as a basis for a course on differential forms for "users" of Mathematics. In Chapter 2 we start integrating differential forms of degree one along curves in Rn. This already allows some applications of the ideas of Chapter 1. This material is not used in the rest of the book. In Chapter 3 we present the basic notions of differentiable manifolds. It is useful (but not essential) that the reader be familiar with the notion of a regular surface in R3. In Chapter 4 we introduce the notion of manifold with boundary and prove Stokes theorem and Poincare's lemma. Starting from this basic material, we could follow any of the possi- ble routes for applications: Topology, Differential Geometry, Mechanics, Lie Groups, etc. We have chosen Differential Geometry. For simplicity, we re- stricted ourselves to surfaces.