

1. Record Nr.	UNINA9910254333603321
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Titolo	Fundamentals of tensor calculus for engineers with a primer on smooth manifolds // by Uwe Mühlich
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2017
ISBN	3-319-56264-9
Edizione	[1st ed. 2017.]
Descrizione fisica	1 online resource (XII, 125 p. 23 illus.)
Collana	Solid Mechanics and Its Applications, , 0925-0042 ; ; 230
Disciplina	515.63
Soggetti	Mechanics Mechanics, Applied Continuum physics Mathematical physics Physics Solid Mechanics Classical and Continuum Physics Mathematical Applications in the Physical Sciences Mathematical Methods in Physics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	1 Introduction -- 2 Notes on point set topology -- 3 The nite dimensional real vector space -- 4 Tensor Algebra -- 5 Afne space and euclidean space -- 6 Tensor analysis in euclidean space -- 7 A primer on smooth manifolds -- B Further Reading.
Sommario/riassunto	This book presents the fundamentals of modern tensor calculus for students in engineering and applied physics, emphasizing those aspects that are crucial for applying tensor calculus safely in Euclidian space and for grasping the very essence of the smooth manifold concept. After introducing the subject, it provides a brief exposition on point set topology to familiarize readers with the subject, especially with those topics required in later chapters. It then describes the finite dimensional real vector space and its dual, focusing on the usefulness of the latter for encoding duality concepts in physics. Moreover, it

introduces tensors as objects that encode linear mappings and discusses affine and Euclidean spaces. Tensor analysis is explored first in Euclidean space, starting from a generalization of the concept of differentiability and proceeding towards concepts such as directional derivative, covariant derivative and integration based on differential forms. The final chapter addresses the role of smooth manifolds in modeling spaces other than Euclidean space, particularly the concepts of smooth atlas and tangent space, which are crucial to understanding the topic. Two of the most important concepts, namely the tangent bundle and the Lie derivative, are subsequently worked out.
