# BOOK REVIEWS

STEPHEN L. CAMPBELL and CARL D. MEYER, *Generalized Inverses of Linear Transformations*, Society for Industrial and Applied Mathematics, Philadelphia, USA, 2009, ISBN 978-0-898716-71-9, XX+272 pp.

The book (no. 56 in the *Classics in Applied Mathematics Series* of SIAM) is an unabridged republication of the work published by Dover Publication, Inc. 1991, which in its turn is a corrected republication of the work first published by Pitman Publishing Limited, London, 1979.

The generalized inverse (the pseudoinverse) of a linear transformation between two finite dimensional vector spaces is a standard and very important mathematical concept, used in many areas.

This work provides exhaustive information (at the moment of its publication) regarding the concept of generalized inverse, and presents the main types of generalized inverse and their usefulness in other branches of science.

The book contains 12 chapters. Chapters 0–4, 6, 7, 10 and 12 discuss the theory of generalized inverse and the notions concerning this concept, while chapters 5, 8, 9 and 11 provide applications of the generalized inverse. The chapters of the book are: 1. The Moore-Penrose or generalized inverse; 2. Least squares solutions; 3. Sums, partitioned matrices and constrained generalized inverse; 4. Partial isometries and EP matrices; 5. The generalized inverse in electrical engineering; 6. $(i, j, k)$ - Generalized inverses and linear estimation; 7. The Drazin inverse; 8. Applications of the Drazin inverse to the theory of finite Markov chains; 9. Applications of the Drazin inverse; 10. Continuity of the generalized inverse; 11. Linear programming; 12. Computational concerns.

In the preface to the Classics Edition, the authors have included a selective bibliography, pointing out the major developments in the field (especially on Markov chains and on differential-algebraic systems).

The book succeeds to present, in a unified and elaborate manner, the theory of generalized inverses, including both traditional results and recent results from this field (at the time of its publication).

The important role held by the concept of generalized inverse in the study and the solving of the considered problems is also pointed out in applications.

The book is self-contained, its reading requiring modest knowledge of linear algebra. It is recommended to students and it is a must for researchers from various branches of mathematics, engineers and practitioners.

This book constitutes an outstanding work, which abundantly deserves its publication in the Classics in Applied Mathematics series of SIAM.

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