

Preface

Arguably the most potent mathematical tool ever created, linear algebra is a fundamental branch of mathematics. This book represents a balanced combination of step-by-step explained theory content, solved examples and exercises. The abundant examples and detailed explanations of all topics, such as vector spaces, linear independence, basis, linear transformations, matrices, determinants, inner products, eigenvectors, bilinear forms and canonical forms are what make the text so valuable.

The early introduction of concepts such as fields, rings, group homomorphism and binary operations gives students a proper foundation on which they can understand the remaining part of the text.

The book includes numerous examples at varying levels of difficulty, each carefully selected. The fundamentals are presented in a clear, methodical and straightforward manner, with many worked-out examples illustrating the concepts and problem-solving techniques. This book can serve as a textbook for undergraduate and graduate linear algebra courses in mathematics and engineering at any university. It also includes some of the latest and most challenging questions suitable for competitive exams in higher education mathematics. The text is structured to support students in their degree programs and to assist them in preparing for future higher education competitive exams in linear algebra.

I acknowledge the influence of numerous authors whose works have guided my writing. The results in this book belong to the collective heritage of mathematics, and crediting all contributors would be a difficult task. No theorem presented here should be assumed to be my original contribution. However, I have endeavored to present linear algebra and prove its theorems in the most effective way, without strictly adhering to traditional methods and proofs found in most textbooks.

I express my deep appreciation and thanks to VIT University, Chennai, for providing the infrastructural facilities to write this book. My gratitude extends to my younger brother, Birendra Kumar Maurya, for his assistance in typing, and to my wife, Mahasweta, for her encouragement and support. I am also grateful to my parents for their blessings and hard work, which have brought me to this level.

Finally, I thank De Gruyter for offering the platform to publish this book. Special thanks to Ranis N. Ibragimov for his excellent work as an editor and Nadja Schedensack for her skillful copyediting.

Despite careful efforts, some errors and misprints may have escaped my notice. I welcome any feedback and suggestions for improving the book.

Saurabh Chandra Maury

