



A Modern Introduction to Linear Algebra

By Henry Ricardo

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Useful Concepts and Results at the Heart of Linear Algebra

A one- or two-semester course for a wide variety of students at the sophomore/junior undergraduate level

A Modern Introduction to Linear Algebra provides a rigorous yet accessible matrix-oriented introduction to the essential concepts of linear algebra. Concrete, easy-to-understand examples motivate the theory.

The book first discusses vectors, Gaussian elimination, and reduced row echelon forms. It then offers a thorough introduction to matrix algebra, including defining the determinant naturally from the $PA=LU$ factorization of a matrix. The author goes on to cover finite-dimensional real vector spaces, infinite-dimensional spaces, linear transformations, and complex vector spaces. The final chapter presents Hermitian and normal matrices as well as quadratic forms.

Taking a computational, algebraic, and geometric approach to the subject, this book provides the foundation for later courses in higher mathematics. It also shows how linear algebra can be used in various areas of application. Although written in a "pencil and paper" manner, the text offers ample opportunities to enhance learning with calculators or computer usage.

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Review

"This work is a sound presentation of linear algebra. ... Each topic is carefully and thoroughly covered via the pedagogy ... The volume includes more than 1,200 exercises, some to be completed manually and others intended to be solved using a computer algebra system. ... The generality of approach makes this work appropriate for students in virtually any discipline. Summing Up: Recommended."

?CHOICE, June 2010

"The author of this text, Henry Ricardo, has identified several shortcomings of typical courses on linear algebra and provides an exciting offering how to overcome them ... The key advantage of this text is that the crucial topic of eigenvalues and eigenvectors is reached as fast as possible! Chapter 4 is earlier than in most texts, and the integration of determinants within that chapter is a good way to keep that topic in the right place today. The single most exciting choice of this text is to start the semester with material on vectors (n -dimensional real vectors). This allows for fast introduction to material that is new to students both to catch their interest and to demonstrate that this class deals with material that is very new to most of them. And it sets up the entire text for the proper perspective in higher level mathematics of having vectors as elements of spaces."

?Matthias Gobbert, University of Maryland, Baltimore County, USA

About the Author

Henry Ricardo is a professor of mathematics at Medgar Evers College of the City University of New York, where he was presented with the 2008 Distinguished Service Award by the School of Science, Health and Technology. Dr. Ricardo was also given the 2009 Distinguished Service Award by the Metropolitan New York Section of the MAA, of which he is the Governor.

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