

Synopsis

Linear algebra and matrix theory are essentially synonymous terms for an area of mathematics that has become one of the most useful and pervasive tools in a wide range of disciplines. It is also a subject of great mathematical beauty. In consequence of both of these facts, linear algebra has increasingly been brought into lower levels of the curriculum, either in conjunction with the calculus or separate from it but at the same level. A large and still growing number of textbooks has been written to satisfy this need, aimed at students at the junior, sophomore, or even freshman levels. Thus, most students now obtaining a bachelor's degree in the sciences or engineering have had some exposure to linear algebra. But rarely, even when solid courses are taken at the junior or senior levels, do these students have an adequate working knowledge of the subject to be useful in graduate work or in research and development activities in government and industry. In particular, most elementary courses stop at the point of canonical forms, so that while the student may have "seen" the Jordan and other canonical forms, there is usually little appreciation of their usefulness. And there is almost never time in the elementary courses to deal with more specialized topics like nonnegative matrices, inertia theorems, and so on. In consequence, many graduate courses in mathematics, applied mathematics, or applications develop certain parts of matrix theory as needed.

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Customer Reviews

"...Each section has a set of problems and each chapter closes with (true/false) review questions and a section which discusses the references and extensions which pertain to the topics in the chapter. These problems and questions seem to be well chosen. The book will be quite useful to its intended audience." -- MATHEMATICAL REVIEWS

One of the things I have learned about what makes a good book is the idea that you learn the material, and then the problems force you to know the material well by giving interesting but challenging problems. This book lacks those kinds of problems. Instead, most of the problems are usually extremely easy and never anything more than a technical result. By knowing simply the definition of something, one can actually do most of these problems. What motivation is there to learn the material in some depth? Of course people can say, "Well, it is your responsibility to learn the material when test time comes." And I agree with that wholeheartedly; however, if the material is extremely uninteresting, the process of learning the material becomes much less pleasant. Another thing I would mention about this book is that it is entirely unorganized. When reading this book, you feel like there is no direction in the book. Instead, it is just a jumble of material that you should know at some point. But even within the chapters, nothing leads to anything; all he has is a collection of topics that fall in some general category. It feels like a lower level math book. Putting a few major theorems up could make the material interesting. But instead it is a collection of topics whose results are technical at best. Another thing that is slightly bad is that Ortega sometimes states an important result in the middle of a discussion, and then not leave a citation number on it. It causes some problem when citing results, as you have to put a page number, which feels entirely unorthodox. That being said, his presentation of the material is typically clear (although on some presentation could have used a little more clarity, such as QR orthogonalization.) He does not bloviate either; he gets to the point. There are also very few errors in this book, and that is very good quality in a text book these days. That being said, as a classroom book, this book does not work for its lack of challenge or motivation. That also applies for this book as a self study book. But as a reference book, alongside another book, this book would do a decent job.

It's pretty hard to read, as the author doesn't tend to explain his vocab or notation, but not the worst of all the textbooks I've had.

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