Vector Calculus, Linear Algebra, and Differential Forms: A Unified Approach (2nd Edition)

By John H. Hubbard, Barbara Burke Hubbard

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Using a dual presentation that is rigorous and comprehensive—yet *exceptionaly reader-friendly* in approach—this book covers most of the standard topics in multivariate calculus and an introduction to linear algebra. It focuses in underlying ideas, integrates theory and applications, offers a host of learning aids, features coverage of differential forms, and emphasizes numerical methods that highlight modern applications of mathematics. The revised and expanded content of this edition includes new discussions of functions; complex numbers; closure, interior, and boundary; orientation; forms restricted to vector spaces; expanded discussions of subsets and subspaces of R^n; probability, change of basis matrix; and more. For individuals interested in the fields of mathematics, engineering, and science—and looking for a unified approach and better understanding of vector calculus, linear algebra, and differential forms.

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Editorial Review

From the Author
Several readers have complained about the lack of a student solution manual. One now exists, published by Matrix Editions. Errata for the book are posted on the book web site (URL given in the book). The most recent posting was Feb. 29, 2002. Readers who wish to be notified by e-mail when new errata are posted can sign up via the web site or e-mail the authors (address given in the book).

What's new in the second edition (the one with the pale yellow cover now being sold):

The main change is that we introduce a new approach to Lebesgue integration. In addition, the second edition has approximately 270 additional exercises and 50 additional examples. We have added pictures of mathematicians and more historical notes. There are now end-of-section exercises, as well as review exercises for Chapters 1--6. Some useful formulas are listed on the back cover.

More difficult material from Chapter 0 was moved to the Appendix. The inverse and implicit function theorems have been rewritten. In Chapter 3 we simplified the definition of a manifold, and we now begin with the general case and discuss curves and surfaces as examples. Similarly, in Chapter 5, we eliminated the separate sections on arc length and surface area; we now have one section on volume of manifolds.

In Chapter 6, we rewrote the discussion of orientation and changed the definition of a piece-with-boundary of a manifold, to make it both simpler and more inclusive.

From the Back Cover
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About the Author

John H. Hubbard (BA Harvard University, PhD University of Paris) is professor of mathematics at Cornell University and at the University of Provence in Marseilles he is the author of several books on differential equations. His research mainly concerns complex analysis, differential equations, and dynamical systems. He believes that mathematics research and teaching are activities that enrich each other and should not be separated.

Barbara Burke Hubbard (BA Harvard University) is the author of *The World According to Wavelets,* which was awarded the prix d'Alembert by the French Mathematical Society in 1996.

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Antoinette Lefebre:

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James Scott:

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Jeffrey Price:

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