

# Preface

The main reason for a fourth edition of *Essential MATLAB for Engineers and Scientists* is to keep up with MATLAB, now in its latest version (7.7 Version 2008B). Like the previous editions, this one presents MATLAB as a problem-solving tool for professionals in science and engineering, as well as students in those fields, who have no prior knowledge of computer programming.

In keeping with the late Brian D. Hahn's objectives in previous editions, the fourth edition adopts an informal, tutorial style for its "teach-yourself" approach, which invites readers to experiment with MATLAB as a way of discovering how it works. It assumes that readers have never used this tool in their technical problem solving.

MATLAB, which stands for "Matrix Laboratory," is based on the concept of the matrix. Because readers will be unfamiliar with matrices, ideas and constructs are developed gradually, as the context requires. The primary audience for *Essential MATLAB* is scientists and engineers, and for that reason certain examples require some first-year college math, particularly in Part 2. However, these examples are self-contained and can be skipped without detracting from the development of readers' programming skills. MATLAB can be used in two distinct modes. One, in keeping with the modern-age craving for instant gratification, offers immediate execution of statements (or groups of statements) in the Command Window. The other, for the more patient, offers conventional programming by means of script files. Both modes are put to good use here: the former encouraging cut and paste to take full advantage of Windows' interactive environment; the latter stressing programming principles and algorithm development through structure plans.

Although most of MATLAB's basic ("essential") features are covered, this book is neither an exhaustive nor a systematic reference. This would not be in keeping with its informal style. For example, constructs such as `for` and `if` are not always treated, initially, in their general form, as is common in many texts, but are gradually introduced in discussions where they fit naturally. Even so, they are treated thoroughly here, unlike in other texts that deal with them only superficially. For the curious, helpful syntax and function quick references

can be found in the appendices. The following list contains other highlights of *Essential MATLAB for Engineers and Scientists*, fifth edition:

1. Warnings of the many pitfalls that await the unwary beginner.
2. Numerous examples taken from science and engineering (simulation, population modeling, numerical methods) as well as business and everyday life.
3. An emphasis on programming style to produce clear, readable code.
4. Comprehensive chapter summaries.
5. Chapter exercises (answers and solutions to many of which are given in an appendix).
6. A thorough, instructive index.

*Essential MATLAB* is meant to be used in conjunction with the MATLAB software. The reader is expected to have the software at hand in order to work through the exercises and thus discover how MATLAB does what it is commanded to do. Learning any tool is possible only through hands-on experience. This is particularly true with computing tools, which produce correct answers only when the commands they are given and the accompanying data input are correct and accurate.

## ACKNOWLEDGMENTS

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