

PREFACE TO THE FIFTH EDITION

The purpose of the present edition is the same as that of the first four: to present the basic fundamentals of aerospace engineering at the introductory level in the clearest, simplest, and most motivating way possible. Since the book is meant to be enjoyed as well as understood, I have made every effort to ensure a clear and readable text. The choice of subject matter and its organization, the order in which topics are introduced, and how these ideas are explained have been carefully planned with the uninitiated reader in mind. Because the book is intended as a self-contained text at the first- and second-year levels, I avoid tedious details and massive “handbook” data. Instead, I introduce and discuss fundamental concepts in a manner that is as straightforward and clear-cut as possible, knowing that the book has also found favor with those who wish to learn something about this subject outside the classroom.

The overwhelmingly favorable response to the earlier editions from students, teachers, and practicing professionals both here and abroad is a source of gratification. Particularly pleasing is the fact that those using the book have enjoyed reading its treatment of the fascinating, challenging, and sometimes awesome discipline of aerospace engineering.

Thanks to this response, the contents of the fourth edition have been carried over into the fifth edition with only minor modifications. A hallmark of this book is the use of specially designed devices to enhance the readers’ understanding of the material. In particular, carried over from the fourth edition are

1. Roadmaps placed at the beginning of each chapter to help guide the reader through the logical flow of the material.
2. *Design Boxes* containing discussions that deal with interesting and important applications of the fundamental material; these are literally set apart in boxes.

In the same spirit, the fifth edition contains new material intended to further enhance the education and interest of the reader, as follows:

1. A second type of box appears in this edition, namely *Preview Boxes*, located at the beginning of each chapter. The preview boxes are intended to provide the reader with insight about what each chapter is about and why the material is so important. I intend the preview boxes to be *motivational*, to make the reader interested and curious enough to pay extra-close attention to the content of the chapter. These preview boxes blatantly “market” the material of each chapter. They are written in a particularly informal manner to help turn the reader on to the content. In these preview boxes, I am unabashedly admitting to providing some fun for the readers.

2. Uninhabited aerial vehicles (UAVs) and uninhabited combat aerial vehicles (UCAVs) are becoming an important part of aerospace engineering. A whole section on UAVs and UCAVs has been added to Chapter 6.
3. Enhanced explanations of some of the more difficult concepts, aimed at faster and better understanding of the material, have been added.
4. More emphasis has been placed on the better understanding of various units and their proper use in calculations.
5. A number of additional worked examples have been added to further help the reader understand how to use what he or she has been reading.
6. Included in this new material are about 20 new figures to help illustrate the basic ideas.

All told, the new material represents a meaningful enhancement of *Introduction to Flight*.

At the University of Maryland, this text is used for an introductory course for sophomores in aerospace engineering. It leads directly into a second book by the author, *Fundamentals of Aerodynamics*, 3d ed. (McGraw-Hill, 2000), which is used in a two-semester junior–senior aerodynamics course. This, in turn, feeds into a third text, *Modern Compressible Flow: With Historical Perspective*, 3d ed. (McGraw-Hill, 2003), used in a course for advanced undergraduates and first-year graduate students. The complete triad is intended to give students a reasonable technical and historical perspective on aerospace engineering in general and aerodynamics in particular.

I am very grateful to Mrs. Susan Cunningham, who did such an excellent job typing the manuscript. I am fortunate to have such dedicated and professional help from one of the best scientific typists in the world. My gratitude also goes out to my wife of 43 years, Sarah-Allen, who has helped to motivate and expedite the effort that has gone into this book.

I also thank the following reviewers for their valuable feedback: B. Terry Beck, Kansas State University; Ira M. Cohen, University of Pennsylvania; Bruce Conway, University of Illinois, Urbana–Champaign; Fred R. DeJarnette, North Carolina State University; Don Edberg, California State Polytechnic University, Pomona; Ratneshwar Jha, Clarkson University; Thomas J. Mueller, University of Notre Dame; Eugene E. Niemi, Jr., University of Massachusetts, Lowell; Lakshmi Sankar, Georgia Institute of Technology; and Paavo Sepri, Florida Institute of Technology.

Finally, emphasizing that the study, understanding, and practice of the profession of aerospace engineering is one of the most gratifying of human endeavors and that my purpose is to instill a sense of enthusiasm, dedication, and love of the subject, let me simply say to the reader: read, learn, and enjoy.

John D. Anderson, Jr.