

## **PREFACE TO THE FIRST EDITION**

**T**his book is an introduction to aerospace engineering from both the technological and historical points of view. It is written to appeal to several groups of people: (1) students of aerospace engineering in their freshman or sophomore years in college who are looking for a comprehensive introduction to their profession, (2) advanced high-school seniors who simply want to learn what aerospace engineering is all about, (3) both college undergraduate and graduate students who want to obtain a wider perspective on the glories, the intellectual demands, and the technical maturity of aerospace engineering, and (4) working engineers who simply want to obtain a firmer grasp on the fundamental concepts and historical traditions that underlie their profession.

As an introduction to aerospace engineering, this book is unique in at least three ways. First, the vast majority of aerospace engineering professionals and students have little knowledge or appreciation of the historical traditions and background associated with the technology that they use almost every day. To fill this vacuum, the present book attempts to marble some history of aerospace engineering into the parallel technical discussions. For example, such questions as who was Bernoulli, where did the Pitot tube originate, how did wind tunnels evolve, who were the first true aeronautical engineers, and how did wings and airfoils develop are answered. The present author feels strongly that such material should be an integral part of the background of all aerospace engineers.

Second, this book incorporates both the SI and the English engineering system of units. Modern students of aerospace engineering must be bilingual—on one hand, they must fully understand and feel comfortable with the SI units, because most modern and all future literature will deal with the SI system; on the other hand, they must be able to read and feel comfortable with the vast bulk of existing literature, which is predominantly in engineering units. In this book, the SI system is emphasized, but an honest effort is made to give the reader a feeling for and understanding of both systems. To this end, some example problems are worked out in the SI system and others in the English system.

Third, the author feels that technical books do not have to be dry and sterile in their presentation. Instead, the present book is written in a rather informal style. It attempts to talk to the reader. Indeed, it is intended to be almost a self-teaching, self-pacing vehicle that the reader can use to obtain a fundamental understanding of aerospace engineering.

This book is a product of several years of teaching the introductory course in aerospace engineering at the University of Maryland. Over these years, students have constantly encouraged the author to write a book on the subject, and their repeated encouragement could not be denied. The present book is dedicated in part to these students.

Writing a book of this magnitude is a total commitment of time and effort for a longer time than the author likes to remember. In this light, this book is dedicated to my wife, Sarah-Allen, and my two daughters, Katherine and Elizabeth, who relinquished untold amounts of time with their husband and father so that these pages could be created. To them I say thank you, and hello again. Also, hidden between the lines, but ever-so-much present is Edna Brothers, who typed the manuscript in such a dedicated fashion. In addition, the author wishes to thank Dr. Richard Hallion and Dr. Thomas Crouch, curators of the National Air and Space Museum of the Smithsonian Institution, for their helpful comments on the historical sections of this manuscript, and especially Dick Hallion, for opening the vast archives of the museum for the author's historical research. Also, many thanks are due to the reviewers of this manuscript, Professor J. J. Azar of the University of Tulsa, Dr. R. F. Brodsky of Iowa State University, Dr. David Caughey of Sibley School of Mechanical and Aerospace Engineering, and Professor Francis J. Hale of North Carolina State University; their comments have been most constructive, especially those of Dr. Caughey and Professor Hale. Finally, the author wishes to thank his many colleagues in the profession for stimulating discussions about what constitutes an introduction to aerospace engineering. Hopefully, this book is a reasonable answer.

**John D. Anderson, Jr.**