

Preface

This book addresses an important gap in the aerospace literature by presenting flight mechanics in an accessible manner. It covers the flight mechanics of aircraft, spacecraft, and rockets in simple terms and purely on physical principles. Those readers who have no training in engineering mathematics, yet would like to understand how the various flight vehicles operate, will find this book especially useful.

The book contains neither any mathematical equations, data tables, nor references to technical literature. The focus is on explaining the important physical principles through simple examples and illustrations.

When the Wright brothers designed, tested, built, and flew the first heavier-than-air powered machine more than a century ago, they had little knowledge of the mathematical concepts such as the Laplace equation, integral calculus, vector algebra, and so on. But they did have the proper understanding of the physical principles behind flight mechanics, which they successfully put into practice. This book is written mainly to help a reader without an engineering education to grasp the fundamental aspects of airplane, rocket, and space flight. It is not necessary to take an engineering course or to read an engineering textbook for understanding the basic flight concepts. However, it is hoped that this book can serve as a “primer” in motivating a reader to study flight mechanics as a formal subject. For a formal mathematical and computational coverage of most of the topics covered here, the reader can refer to the author’s textbook (*Atmospheric and Space Flight Dynamics – Modeling and Simulation*, Birkhäuser, Boston, 2007).

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A Simple Approach Without Equations

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