



Flight Dynamics

By Robert F. Stengel

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Flight Dynamics takes a new approach to the science and mathematics of aircraft flight, unifying principles of aeronautics with contemporary systems analysis. While presenting traditional material that is critical to understanding aircraft motions, it does so in the context of modern computational tools and multivariable methods. Robert Stengel devotes particular attention to models and techniques that are appropriate for analysis, simulation, evaluation of flying qualities, and control system design. He establishes bridges to classical analysis and results, and explores new territory that was treated only inferentially in earlier books. This book combines a highly accessible style of presentation with contents that will appeal to graduate students and to professionals already familiar with basic flight dynamics.

Dynamic analysis has changed dramatically in recent decades, with the introduction of powerful personal computers and scientific programming languages. Analysis programs have become so pervasive that it can be assumed that all students and practicing engineers working on aircraft flight dynamics have access to them. Therefore, this book presents the principles, derivations, and equations of flight dynamics with frequent reference to MATLAB functions and examples.

By using common notation and not assuming a strong background in aeronautics, *Flight Dynamics* will engage a wide variety of readers. Introductions to aerodynamics, propulsion, structures, flying qualities, flight control, and the atmospheric and gravitational environment accompany the development of the aircraft's dynamic equations.

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Editorial Review

Review

"[A] tour de force of a text. . . . This is an ambitious and important work. . . . As the very latest of this genre, Prof. Stengel's hefty volume brings the material up to the minute, tackles more topics with more depth, buttresses its analysis with MATLAB examples, and still does a superb job of stimulating and informing the reader. . . . [I]ts push toward computational synthesis does open a new door for this type of text."--**John Hodgkinson, AIAA Journal**

"This book provides a significant addition to the existing literature on flight mechanics. It deserves to be part of the library of scholars and practicing flight mechanics engineers alike. The use of this text in an undergraduate course would require skilled care but would provide a valuable resource to its owner well past graduation."--**Eric Feron, IEEE Control Systems**

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"A monumental piece of work. Its comprehensive treatment of flight dynamics makes it the broadest in its class and constitutes a major contribution to the aerospace community. Destined for students' shelves as well as mine, it will also be valuable as the methodological companion to the aircraft designer, flight test engineer, and pilot."--Eric Feron, Massachusetts Institute of Technology

"This book is definitely a significant contribution to the field. It is more comprehensive than any other work on flight dynamics I have seen; it includes newer concepts, such as neural nets and wind shear effects, some of these reflecting the author's own research; and it gives a very broad view of flight dynamics. Not only is it a fine textbook on flight dynamics, but it is so thorough and so well written that it will undoubtedly catch the attention of practicing engineers and airplane enthusiasts."--Haim Baruh, Rutgers University

From the Back Cover

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