

thus a cascade blade response function is introduced to model gust interactions, since the blades in a row are in close proximity.

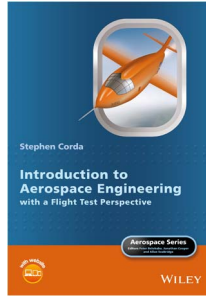
The book covers flow noise sources generated by turbomachinery, including ducted fans, rotors, boundary-layer and edge scattering noise (noted exceptions being jet and shock-associated noise). Although there are no problems or solutions accompanying each chapter, it is noteworthy that throughout the text there are detailed derivations of many of the key mathematical formulae, including helpful and clear line-by-line algebraic and tensor manipulations. This should enable the reader to re-derive some of the key theoretical results, thereby enhancing their comprehension of complex concepts and methods found in selective scientific papers on aeroacoustics.

In summary, this is an excellent new reference book for scientists and engineers with interests in the fields of aerodynamics and acoustics. The book is a comprehensive and authoritative new treatise on aeroacoustics and highly recommended for readers familiar with or new to this field.

REFERENCES

1. GOLDSTEIN, M.E. *Aeroacoustics*. McGraw-Hill Inc; 1976, New York.
2. MUELLER, T.J (Editor). *Aeroacoustic Measurements*. Springer-Verlag; 2002, Berlin.

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Introduction to Aerospace Engineering: with a Flight Test Perspective

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John Wiley and Sons, The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, UK, 2017; 903pp. Illustrated. £76.50. ISBN 978-1-118-95336-5.

Whilst there are already a number of good introductory texts for a wide variety of aerospace disciplines, the author of this book brings together four key fields of knowledge for any aerospace engineer or aircraft designer under the same cover: aerodynamics, propulsion, performance and aircraft stability. Where this book goes beyond the norm is to relate each of these fields to the practice of flight testing (and sometimes ground-based tests), illustrating the usefulness of the theory and knowledge in each to the undertaking of experimental testing. This affords the reader some context to, and application of, the theory which is arguably missing in many other similar texts.

Clearly aimed at students, the content of the topics presented is modern, but standard,

and the text contains several example calculations to practice the material as well as questions at the end of the main chapters. Before diving into each of the four fields mentioned previously the author begins with a thorough, interesting, and up-to-date introduction to general aviation. A second chapter at the start of the book covers some fundamental core concepts of aerospace engineering and flight testing. The wide variety of topics covered here is done in a somewhat haphazard fashion but should prove helpful to students. The section and examples illustrating the importance of diligence in using engineering units is especially insightful.

The remaining four chapters in this book address each of the four aerospace disciplines in turn. Chapter 3 (Aerodynamics) is the largest chapter of the book, providing detailed summaries of fundamental fluid and aerodynamic theory, thermodynamics, viscosity and aircraft-specific topics including supersonic and hypersonic flows. Chapter 4 details the standard thrust calculations for thrust and power-rated engines, but also discusses rocket propulsion and gives the reader an overview of space-based propulsion techniques. Chapter 5 reviews the typical performance equations for fixed-wing aircraft. The book concludes with Chapter 6 covering the basics of flight controls and static and dynamic stability concepts in both longitudinal and lateral-directional planes of motion. The author's experience as an educator and pilot is evident in the clear and accessible style of writing, especially for the descriptions of the example flight tests that are provided for a wide variety of aircraft throughout the book.

At a little under 900 pages, the book goes into quite some depth in the fields it covers. However, it gives no substantial mention of other fields such as materials, structural design, aircraft systems or automatic flight control. And, whilst the author provides descriptions of the practical issues around flight testing they are not as detailed as the treatment of the other material in the book. Neither are data acquisition, data reduction or parameter identification techniques covered in much detail, instead being mentioned in passing. The treatment of flight testing in the book is more descriptive of some operational aspects rather than covering the mathematical and modelling underpinning flight test engineers make use of. This should not be taken as criticism for an introductory book of such detail and for the audience it is intended for, but readers specifically interested in those other topics will find little to no details here.

This book is still aptly titled though, providing a detailed introduction to some important fields in aerospace engineering with useful context to the practical use and demonstration of the theories in flight testing. This, together with its clear, well-written content and reasonable pricing, makes the book attractive to prospective or current undergraduate students.

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