

Flight Theory and Aerodynamics: a Practical Guide for Operational Safety – Third edition

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John Wiley and Sons, The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ. 2017. xiii; 363pp. Illustrated. £135. ISBN 978-1-119-23340-4.

The topic of aircraft performance and flight mechanics has been addressed by multitude of intended audiences. With *Flight Theory and Aerodynamics: a Practical Guide for Operational Safety*, the authors' intended goal appears to be the aviation enthusiast or pilot intending to build on the basic aerodynamics and flight mechanics discussed during flight training.

Assuming a minimal reader background in physics and aerodynamics, the first third of the book is devoted to an introduction of key background concepts. The book starts from a discussion of fundamental concepts in classical mechanics and kinematics in Chapter 1, followed by an introduction to the flight environment and measurement of airspeed in

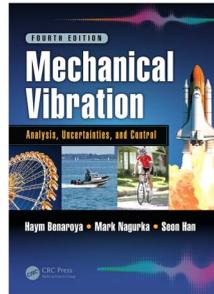
Chapter 2. The next three chapters discuss the general aerodynamic design of aircraft and the lift and drag forces. While a mathematical treatment of the topics is largely absent, key aircraft aerodynamic concepts such the effects of viscosity on the lift and drag force or the mechanism by which lift induced drag is generated are briefly yet effectively communicated.

The remainder of the book builds on these core ideas to discuss the performance, stability and control of fixed-wing aircraft. Clear distinctions are drawn when jet and propeller based aircraft are discussed and the summaries identifying the impact of weight, altitude, configuration, ground effect and wind and runway conditions on an aircraft's flight and field performance metrics are very clear and to the point, albeit in mostly qualitative terms. The stability section effectively communicates the key ideas behind pitch, directional and lateral stability, identifying how these are affected by the aircraft's design and how they are related to operational considerations such as aircraft loading. Given the strong prior focus on subsonic flight, Chapter 16 discussing high-speed flight is a welcome addition; however, little is done to relate the qualitative discussion of supersonic aerodynamics to its implications in aircraft performance and flight mechanics. A final chapter on the flight performance of rotorcraft presents a clear and easily comprehensible rather high-level introduction to how helicopters fly, rotor dynamics and the origins behind some of their limitations in performance.

Overall, this book can serve as a very clear summary for a wide range of aerodynamic concepts and their impact upon the flight of

an aircraft, which I would gladly keep in my bookshelf. The multiple choice questions presented at the end of each chapter in particular are excellent for testing one's understanding and helpfully concentrate on conceptual understanding. However, in wholly omitting the derivations of equations presented and the majority of the quantitative aspects of the topics, this book raises the question as to whether their target audience would be equally served by reading the FAA's *Pilot's Handbook of Aeronautical Knowledge* (https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/phak/media/pilot_handbook.pdf) instead.

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Mechanical Vibration: Analysis, Uncertainties and Control – Fourth edition

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CRC Press, Taylor & Francis Group, 6000 Broken Sound Parkway NW, Suite 300, Boca Raton, FL, 33487-2742, USA. 2018.

Distributed by Taylor & Francis Group, 2 Park Square, Milton Park, Abingdon, OX14 4RN, UK. xxii; 579pp. Illustrated. £89. (20% discount available to RAeS members via www.crcpress.com using AKQ07 promotion code). ISBN 978-1-4987-5294-7.

In essence, *Mechanical Vibration: Analysis, Uncertainties and Control* is a substantial textbook that covers the broad topic of mechanical vibration. But it is the extensive content and the distinctive format and style that make this a particularly notable book and one which is well suited to those learning the subject for the first time.

The Fourth edition brings a reorganised structure with an updated and expanded content. The content is undoubtedly extensive – with helpful footnotes and references to more advanced texts where necessary – and includes material ranging from senior