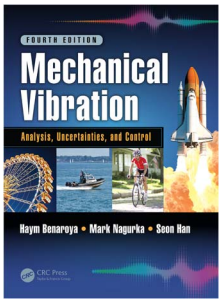
an aircraft, which I would gladly keep in my bookshelf. The multiple choice questions presented at the end of each chapter in particular are excellent for testing one's understanding and helpfully concentrate on conceptual understanding. However, in wholly omitting the derivations of equations presented 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.

Dr Errikos Levis



Mechanical Vibration: Analysis, Uncertainties and Control – Fourth edition

H. Benaroya *et al.*

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

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undergraduate to postgraduate level. The text is primarily aimed at students but practicing engineers should find it a comprehensive reference book, although it does lack any coverage of the finite element method and this may be a disappointment to some.

The presentation follows a logical sequence, from the basics of single-degree-of-freedom systems, through variational principles, multi-degree-of-freedom and continuous systems, to more advanced topics such as random and nonlinear vibration, as well as vibration control. The MATLAB® appendix, covering the response of single- and multi-degree-of-freedom models, is retained from the First edition but with updated example code. A new appendix on viscoelastic damping models is a welcome addition, which generalises the viscous model that dominates most introductory texts.

The authors do not shy away from emphasising the value of understanding the underlying mathematics of the subject. Significant effort has gone into developing the mathematical derivations and supporting text, and the result is readily accessible to engineers given some grounding in linear algebra, calculus and differential equations. The helpful appendix of fundamental mathematical concepts is also retained from the First edition.

The book is nicely formatted and written in a relaxed, engaging style. The many accompanying figures, the broad range of example problems and engineering case studies (from power tools to space elevators), together with the biographies of the famous personalities associated with vibration, all contribute to a particularly informative and enjoyable read.

If it is possible to recommend a single volume on vibration, particularly for those new to the subject, then this book should certainly be on the shortlist.

Dr James Talbot
Department of Engineering,
University of Cambridge, Cambridge, UK

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