Available online at www.sciencedirect.com
SCIENCE DIRECT®
Journal of Sound and Vibration 276 (2004) 471–472
JOURNAL OF SOUND AND VIBRATION
www.elsevier.com/locate/yjsvi

Book review

John G. Papastavridis, Tensor Calculus and Analytical Dynamics, CRC Press, Florida, USA, ISBN 0-84-938-514-8, 1998, pp. xivii + 386, price £55, US$89.95.

Upon taking up the post of book review editor for this Journal I became aware that the following review, written in 1999, had been sent to the Journal office but for unknown reasons did not arrive. Since the book in question is still in print, the review is published now with apologies to readers for the delay.

M.C.M. Wright
Book Review Editor

This book is a useful addition to the literature on tensors and analytical dynamics. As might be guessed from the title, it is divided into two sections; the first concerns itself with tensor calculus and the second with analytical dynamics. The tensor calculus part of the book is split into chapters dealing with introductory matter, tensor algebra and tensor analysis; the chapters in the second section comprise and introduction, consideration of a particle on a curve or surface, Lagrangean mechanics (kinematics) and Lagrangean mechanics (kinetics). The coverage of each of these topics is comprehensive, and the author also provides a good number of problems (with answers) on the material contained in each section.

A quick glance at the introduction suggests that the author has strong views on his subject and 'takes no prisoners'. He describes "the currently popular and religiously promoted matrix notation" as being "a side effect of single-minded and rabid computeritis". I am not sure that I agree entirely with this, but it is hard to argue with Professor Papastavridis's view that academic tenure has been "much maligned by reactionary ideologues, demagogues and ignoramuses".

The book begins with a comprehensive but rather indigestible summary of conventions, notations and basic formulae. This runs to 25 pages and may have been better placed in an appendix at the end of the book. The following three chapters on tensor calculus are carefully set out and every detail is present. I especially liked the manner in which the author gives a number of interpretations of some results; it is always helpful to have a number of different standpoints from which to view mathematics.

On p.166 the theory finishes and we are introduced to the applications that follow from it. Within the space of only a few pages, the power of the tensor approach becomes evident as the problems of a particle on a curve or a surface are swiftly and elegantly dealt with. This theme of a theory that allows both economy and efficiency is maintained up to the end of the book. The author also pays careful regard not just to the minutiae of tensors themselves, but also to their

doi:10.1016/j.jsv.2004.05.001

history and evolution; this helps the reader to trace the development of the subject and is a welcome addition to the theory.

In summary, this volume is recommended to anybody who has an interest in classical tensor analysis and its applications. Though it is by no means 'bedtime reading' (many Doctoral students, for example, might find it rather hard going), the persevering reader is bound to gain a wealth of useful knowledge and insights from this book.

A.D. Fitt
Faculty of Mathematical Studies
University of Southampton
Southampton SO17 1BJ, UK
E-mail address: a.d.fitt@maths.soton.ac.uk